

1 WILLIAM L. ANTHONY, JR. (State Bar No. 106908)
wanthony@orrick.com
2 MATTHEW H. POPPE (State Bar No. 177854)
mpoppe@orrick.com
3 ZHENG LIU (State Bar No. 229311)
jenliu@orrick.com
4 ORRICK, HERRINGTON & SUTCLIFFE LLP
1000 Marsh Road
5 Menlo Park, California 94025
Telephone: +1-650-614-7400
6 Facsimile: +1-650-614-7401

7 Attorneys for Defendant
8 VARIAN MEDICAL SYSTEMS, INC.

9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

UNIVERSITY OF PITTSBURGH OF THE
COMMONWEALTH SYSTEM OF HIGHER
EDUCATION d/b/a UNIVERSITY OF
PITTSBURGH, a Pennsylvania non-profit
corporation (educational),

Plaintiff,

v.

VARIAN MEDICAL SYSTEMS, INC., a
Delaware corporation,

Defendant.

Case No. CV 08-02973 MMC

**REQUEST FOR JUDICIAL NOTICE
IN SUPPORT OF VARIAN'S
MOTION TO DISMISS PLAINTIFF'S
CLAIMS PURSUANT TO FED. R.
CIV. P. 12(B)(6) BASED ON
DOCTRINE OF RES JUDICATA**

Date: September 5, 2008
Time: 9:00 a.m.
Courtroom: 7, 19th Floor

1 Defendant Varian Medical Systems, Inc. (“Varian”) respectfully requests that this Court
2 take judicial notice of the following documents pursuant to Federal Rule of Evidence 201 in
3 support of Varian’s Motion to Dismiss.

4 1. The Complaint in *University of Pittsburgh v. Varian Medical Systems, Inc.*, Case
5 No. 2:07-cv-00491-AJS, in the United States District Court for the Western District of
6 Pennsylvania (the “Penn. Case”) dated April 13, 2007 (Dkt. 1). A true and correct copy of this
7 document is attached hereto as Exhibit A.

8 2. Varian’s Answer and Counterclaim dated May 14, 2007 in the Penn. Case (Dkt.
9 20). A true and correct copy of this document is attached hereto as Exhibit B.

10 3. The Case Management Order dated June 4, 2007 in the Penn. Case (Dkt. 30). A
11 true and correct copy of this document is attached hereto as Exhibit C.

12 4. The Order of Court Re: Deposition Schedule dated October 5, 2007 in the Penn.
13 Case. A true and correct copy of this document is attached hereto as Exhibit D.

14 5. The Civil Docket in the Penn. Case as of June 27, 2008. A true and correct copy
15 of this document is attached hereto as Exhibit E.

16 6. The condensed claim construction hearing transcript dated November 29, 2007 and
17 filed on June 27, 2008 in the Penn Case (Dkt. 322). A true and correct copy of this document is
18 attached hereto as Exhibit F.

19 7. The Report and Recommendation of Special Master filed on March 10, 2008 in the
20 Penn. Case (Dkt. 254). A true and correct copy of this document is attached hereto as Exhibit G.

21 8. The Order Adopting Special Master’s Report and Recommendation (Doc. No.
22 254) in Part; and Granting Defendant’s Motion for Summary Judgment for Lack of Standing
23 (Doc. No. 127) dated April 30, 2008 in the Penn. Case (Dkt. 294). A true and correct copy of this
24 document is attached hereto as Exhibit H.

25 9. University of Pittsburgh’s Motion Pursuant to Federal Rule of Civil Procedure 19
26 to Join Carnegie Mellon University filed on December 5, 2007 in the Penn. Case (Dkt. 149). A
27 true and correct copy of this document is attached hereto as Exhibit I.

28 ////

1 10. The Order Denying Plaintiff's Motion to Join Carnegie Mellon University dated
2 December 14, 2007 in the Penn. Case (Dkt. 1168). A true and correct copy of this document is
3 attached hereto as Exhibit J.

4 11. Varian's Objections to Report and Recommendation of Special Master Re: Motion
5 for Summary Judgment for Lack of Standing filed on March 18, 2008 in the Penn. Case (Dkt.
6 256). A true and correct copy of this document is attached hereto as Exhibit K.

7 12. Declaration of Henry M. Sneath and exhibits in Support of Varian's Objections to
8 Report and Recommendation of Special Master Re: Motion for Summary Judgment for Lack of
9 Standing filed on March 18, 2008 in the Penn. Case (Dkt. 257). A true and correct copy of this
10 document is attached hereto as Exhibit L.

11 13. University of Pittsburgh's Reply to [256] Objections to Report and
12 Recommendation filed on March 26, 2008 in the Penn. Case (Dkt. 272). A true and correct copy
13 of this document is attached hereto as Exhibit M.

14 14. Varian's Reply to "Plaintiff University of Pittsburgh's Reply to Objections to
15 Report and Recommendation" filed on March 26, 2008 in the Penn. Case (Dkt. 271). A true and
16 correct copy of this document is attached hereto as Exhibit N.

17 15. University of Pittsburgh's Motion Requesting Entry of Judgment filed May 15,
18 2008 in the Penn. Case (Dkt. 295). A true and correct copy of this document is attached hereto as
19 Exhibit O.

16. The Judgment dated June 16, 2008 in the Penn. Case (Dkt. 310). A true and
correct copy of this document is attached hereto as Exhibit P.

22 17. University of Pittsburgh's Notice of Appeal filed on June 16, 2008 in the Penn.
23 Case (Dkt. 311). A true and correct copy of this document is attached hereto as Exhibit Q.

DISCUSSION

25 The documents attached hereto are properly subject to judicial notice under Federal Rule
26 of Evidence 201 and established precedent.

27 // /

28 || //

1 **A. This Court Should Take Judicial Notice of the Docket Sheet in the Prior
2 Patent Action Between the Parties in the Western District of Pennsylvania
3 (Exhibit E)**

4 It is appropriate for the Court to take judicial notice of a docket sheet from a court
5 proceeding. *Tercica, Inc. v. Insmed Inc.*, No. 05-5027 SBA, 2006 U.S. Dist. LEXIS 41804, at
6 *28 (N.D. Cal. June 9, 2006) (taking notice of docket sheet of unrelated case); *Wheeler v. City of
7 Oakland*, No. 05-0647 SBA, 2006 U.S. Dist. LEXIS 27680, at *16 (N.D. Cal. Apr. 27, 2006)
8 (“Court filings and orders are the type of documents that are properly noticed under Rule 201;
9 notice can be taken for purpose of recognizing the judicial act that the order or filing represents
10 on the subject matter of the litigation.”); *Johnson v. Alameda County*, No. C 05-3367, 2007 U.S.
11 Dist. LEXIS 73190, at *2 (N.D. Cal. 2007) (taking judicial notice of docket sheet); *Daniels v.
12 Superior Court of Cal.*, No. 08-CV-0208, 2008 U.S. Dist. LEXIS 16867, at *14-15 & nn. 4-5
13 (E.D. Cal. March 5, 2008) (taking notice of Superior Court docket sheet); *San Luis & Delta-
14 Mendota Water Auth. v. Badgley*, 136 F. Supp. 2d 1136, 1146 (E.D. Cal. 2000) (a court may take
15 judicial notice of a document filed in another court to establish the fact of such litigation and
related filings).

16 Consequently, the Court may take judicial notice of Exhibit E.

17 **B. This Court Should Take Judicial Notice of Court Rulings in the Prior Patent
18 Action Between the Parties in the Western District of Pennsylvania (Exhibits
19 C, D, G, H, J, and P)**

20 It is appropriate for the Court to take judicial notice of the entry of a court order or
21 decision in another action. *Overstreet ex rel. NLRB v. United Bhd. of Carpenters & Joiners of
22 Am.*, Local 1506, 409 F.3d 1199, 1204 (9th Cir. 2005) (taking judicial notice of an administrative
23 law judge’s decision); *Papai v. Harbor Tug & Barge Co.*, 67 F.3d 203, 207 (9th Cir. 1994)
24 (judicial notice is properly taken of orders and decisions made by other courts or administrative
25 agencies); *Conopco, Inc. v. Rol Int’l*, 231 F.3d 82, 86-87 & n.3 (2d Cir. 2000) (taking judicial
26 notice of final state trial court judgment and notice of appeal in related case); *321 Studios v.
27 MGM Studios, Inc.*, 307 F. Supp. 2d 1085, 1107 (N.D. Cal. 2004) (taking judicial notice of a
28 court order granting a preliminary injunction); *Asustek Computer, Inc. v. Ricoh Co., Ltd.*, No. C
07-01942, 2007 U.S. Dist. LEXIS 86302, at *3 (N.D. Cal. 2007) (taking judicial notice of

1 summary judgment rendered by another district court in patent infringement proceeding);
 2 *Johnson v. Alameda County*, No. C 05-3367, 2007 U.S. Dist. LEXIS 73190, at *2 (N.D. Cal.
 3 2007) (taking judicial notice of a criminal minute order and judgment).

4 Consequently, the Court may take judicial notice of Exhibits C, D, G, H, J, and P.

5 **C. This Court Should Take Judicial Notice of Pleadings in the Prior Patent
 6 Action Between the Parties in the Western District of Pennsylvania (Exhibits
 A, B, I, K, L, M, N, and O)**

7 It is appropriate for the Court to take judicial notice of the filing of a court pleading, and
 8 its entry in court records. *Beazley v. Fujii*, No. 04-56237, 2007 U.S. App. LEXIS 526, at *2 &
 9 n.1 (9th Cir. Aug. 18, 2006) (judicial notice of complaint); *Hunt v. Check Recovery Sys.*, 178 F.
 10 Supp. 2d 1157, 1160 (N.D. Cal. 2007) (“Judicial notice may be taken of “adjudicative facts” such
 11 as court records, pleadings and other facts not subject to reasonable dispute and either “generally
 12 known” in the community or “capable of accurate and ready determination by reference to
 13 sources whose accuracy cannot be reasonably questioned.”); *Shropshire v. Fred Rappoport Co.*,
 14 294 F. Supp. 2d 1085, 1091 & n.1 (N.D. Cal. 2003) (taking judicial notice of the documents and
 15 pleadings filed in a state court action); *Western Federal Sav. & Loan Ass'n v. Heflin Corp.*, 797 F.
 16 Supp. 790, 792 (N.D. Cal. 1992) (taking judicial notice of an entire state court action file
 17 involving a judicial foreclosure, including both complaint and answer); *Rayon-Terrell v. Contra
 18 Costa County*, No. C-02-2759, 2004 U.S. Dist. LEXIS 22028, at *3 (N.D. Cal. 2004) (taking
 19 judicial notice of defendant’s answer); *Piper v. RGIS Inventory Specialists, Inc.*, No. C-07-00032,
 20 2007 U.S. Dist. LEXIS 44486, at *3 & n.1 (N.D. Cal. 2007) (taking judicial notice of pleadings in
 21 various actions).

22 Consequently, the Court may take judicial notice of Exhibits A, B, I, K, L, M, N, and O
 23 (for the fact that these documents were filed and that the statements contained therein were made
 24 to the court in the Penn. Case, if not for the truth of those statements).

25 **D. This Court Should Take Judicial Notice of the Notice of Appeal Filed by the
 26 University of Pittsburgh in the Prior Patent Action Between the Parties in the
 Western District of Pennsylvania (Exhibit Q)**

27 It is appropriate for the Court to take judicial notice of a notice of appeal filed in another
 28 case. *Conopco, Inc. v. Rol Int'l*, 231 F.3d 82, 86-87 & n.3 (2d Cir. 2000) (taking judicial notice

1 of final state trial court judgment and notice of appeal in related case); *Corder v. Gates*, 104 F.3d
 2 247, 248 & n.1 (9th Cir. 1996) (granting defendant's motion for the court to take judicial notice
 3 of briefs and records in two earlier appeals); *Ervin v. Judicial Council of Cal.*, No. C 06-7479
 4 CW, 2007 U.S. Dist. LEXIS 39554, at *3 & n.2 (N.D. Cal. May 18, 2007) (taking notice of an
 5 appeal in another proceeding); *United States v. Beattie*, No. C-06-3537, 2007 U.S. Dist. LEXIS
 6 40115, at *2 (N.D. Cal. May 14, 2007) (taking judicial notice of defendant's docket on appeal).

7 Consequently, the Court may take judicial notice of Exhibit Q.

8 **E. This Court Should Take Judicial Notice of the Admissions Made by UPitt in
 9 the Prior Patent Action Between the Parties in the Western District of
 10 Pennsylvania, Including Those That It Made in Its Pleadings (Exhibits G, I
 11 and M)**

12 It is appropriate for the Court to take judicial notice of various admissions made by a party
 13 in another action, including any admissions that it made in its pleadings. *In re Collins*, No. 06-
 14 12517, 2007 Bankr. LEXIS 1271, at *1 & n.1 (E.D. Pa. Apr. 5, 2007) ("factual assertions in
 15 pleadings, which have not been superceded by amended pleadings, are judicial admissions against
 16 the party that made them"); *In re Spielberg*, No. 04-16677, 2007 Bankr. LEXIS 991, at *3 & n.1
 17 (B.C. E.D. Pa. March 23, 2007) ("factual assertions in pleadings that have not been superseded by
 18 amended pleadings are judicial admissions against the party that made them"); *In re FleetBoston*
 19 *Fin. Corp. Sec. Litig.*, No. 02-4561, 2007 U.S. Dist. LEXIS 87425, at *119 (N.D.N.J. Nov. 28,
 20 2007) ("the court may take judicial notice of factual admissions in pleadings and other documents
 21 in the public record filed by a party . . . that contradict the party's [subsequent] factual
 22 assertions"; taking judicial notice of the fact that the plaintiffs' losses were caused by defendant's
 23 alleged misstatement pertaining to loan loss reserves, based on defendant's admissions, in
 24 securities case); *Wietschner v. Monterey Pasta Co.*, 294 F. Supp. 2d 1102, 1109 (N.D. Cal. 2003)
 25 (the court may take judicial notice of facts based on the opposing party's admissions); *In re A-Z*
 26 *Elecs., LLC*, 350 B.R. 886, 888 (B.C. D. Idaho) ("The Court takes judicial notice of its files and
 27 records in those cases, Fed. R. Evid. 201, and treats the submissions of the debtors in their
 respective cases as admissions under Fed. R. Evid. 801").

28 Consequently, the Court may take judicial notice of Exhibits G, I and M.

1 **F. This Court Should Take Judicial Notice of Transcripts from a Proceeding at
2 the Western District of Pennsylvania, Including the Claim Construction
3 Hearing Transcript (Exhibit F)**

4 It is appropriate for the Court to take judicial notice of transcripts from a proceeding in
5 another action, including the Claim construction hearing transcript. *Sandpiper Vill. Condo. Ass'n
6 v. Louisiana-Pacific Corp.*, 428 F.3d 831, 837 (9th Cir. 2005) (taking judicial notice of the trial
7 transcript with the district court under Fed. R. Evid. 201); *Biggs v. Terhune*, 334 F.3d 910, 916
8 (9th Cir. 2003) (finding “materials from a proceeding in another tribunal are appropriate for
9 judicial notice” and taking notice of party’s hearing before the Board of Prison Terms;); *Focal
10 Point LLC v. CNA Ins. Co.*, 2008 U.S. Dist. LEXIS 53952, at *3 (N.D. Cal. June 10, 2008) (the
11 court taking judicial notice of the case management hearing transcript under Fed. R. Evid. 201);
12 *Johnson v. Jacques Ferber, Inc.*, 2004 U.S. Dist. LEXIS 9285, at *30 (E.D. Pa. May 18, 2004)
13 (stating “[u]nder Federal Rule of Evidence 201, this Court will take judicial notice of the
14 transcript of Plaintiff’s hearing before Judge Cohen”); *In re Madera*, 2008 Bankr. LEXIS 324, at
15 *3 (E.D. Pa. Feb. 7, 2008) (taking judicial notice of the transcript of a party’s testimony at a
16 hearing); *U.S. v. Board of Educ. of Union City*, 1985 U.S. Dist. LEXIS 14917, at *7-8 (D. N.J.
Oct. 15, 1985)(taking notice of portions of trial transcripts).

17 Consequently, the Court may take judicial notice of Exhibit F.

18 **CONCLUSION**

19 For the foregoing reasons, Varian respectfully requests that the Court take judicial notice
20 of each of the documents referenced herein and attached hereto.

21
22 Dated: July 23, 2008.

23 WILLIAM L. ANTHONY
24 MATTHEW H. POPPE
25 ZHENG LIU
26 ORRICK, HERRINGTON & SUTCLIFFE LLP

27 By: _____ /s/ Matthew H. Poppe
28 Matthew H. Poppe
 Attorneys for Defendant
 VARIAN MEDICAL SYSTEMS, INC.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the REQUEST FOR JUDICIAL NOTICE IN SUPPORT OF VARIAN'S MOTION TO DISMISS PLAINTIFF'S CLAIMS PURSUANT TO FED. R. CIV. P. 12(B)(6) BASED ON DOCTRINE OF RES JUDICATA was served upon the University of Pittsburgh, through its counsel, via:

Hand-Delivery

Facsimile

First Class, US Mail, Postage Prepaid

Certified Mail-Return Receipt Requested

X ECF Electronic Service

Overnight Delivery

at the following addresses:

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: July 23, 2008

/s/ Matthew H. Poppe
Matthew H. Poppe

EXHIBIT A

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

UNIVERSITY OF PITTSBURGH,	:	
Plaintiff,	:	CIVIL ACTION
v.	:	No.
VARIAN MEDICAL SYSTEMS, INC.,	:	JURY TRIAL DEMANDED
Defendant.	:	

COMPLAINT

The Parties

1. Plaintiff University of Pittsburgh ("Plaintiff") is an academic institution with its principle place of business in Pittsburgh, Pennsylvania.
2. Upon information and belief, defendant Varian Medical Systems, Inc. ("Varian") is a Delaware corporation with its principle place of business in Palo Alto, California.

Jurisdiction and Venue

3. This action arises under the patent laws of the United States. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338.
4. Venue is proper in this Court pursuant to 28 U.S.C. § 1391(b).

**Count I
(Claim for Patent Infringement)**

5. Plaintiff is the owner of the entire right, title and interest in and to United States Patent No. 5,727,554 ("the '554 patent"), and United States Patent No. 5,784,431 ("the '431 patent"), referred to collectively herein as the "Patents-In-Suit" each of which pertains to the

Plaintiff's image-guided radiation therapy technology. A true and correct copy of each of the Patents-In-Suit is attached hereto as Exhibits A and B.

6. Plaintiff alleges on information and belief, that Varian has infringed and continues to infringe the Patents-In-Suit by making, using, offering for sale and/or selling in the United States devices that embody or otherwise practice one or more of the claims of the Patents-In-Suit, or by otherwise contributing to infringement or inducing others to infringe the Patents-In-Suit. These acts constitute violations of 35 U.S.C. § 271.

7. Plaintiff has given notice to Varian that Varian's products and systems embody or otherwise practice the claimed subject matter of the Patents-In-Suit. Varian's infringement of the Patents-In-Suit is, has been, and continues to be willful and deliberate.

8. Unless enjoined by this Court, Varian will continue their acts of infringement causing substantial and irreparable harm to Plaintiff.

9. As a direct and proximate result of Varian's infringement of the Patents-In-Suit, Plaintiff has been and continues to be damaged in an amount yet to be determined.

10. This is an exceptional case within the meaning of 35 U.S.C. § 285, and Plaintiff is accordingly entitled to an award of its attorneys' fees.

Request for Relief

WHEREFORE, Plaintiff demands judgment against Varian as follows:

A. Preliminarily and permanently enjoining and restraining the Varian, its officers, directors, employees, agents, servants, successors and assigns, and any and all persons acting in privity or in concert with Varian, from further infringement of the Patents-In-Suit;

B. Assessing against Varian and awarding to Plaintiff damages sufficient to compensate for Varian's infringement of the Patents-In-Suit, and conducting an accounting to

determine said damages, as provided by 35 U.S.C. § 284;

- C. Increasing said damages to three times the amount found or assessed;
- D. Awarding Plaintiff its costs and disbursements in this action, including reasonable attorneys' fees, as provided by 35 U.S.C. § 285; and
- E. Granting to Plaintiff such other and further relief as this Court may deem just and proper.

Jury Demand

Plaintiff hereby demands a jury trial as provided by Rule 38(a) of the Federal Rules of Civil Procedure.

DATED: April 13, 2007

/s/ Christopher K. Ramsey

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
MORGAN, LEWIS & BOCKIUS LLP
One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com

Daniel Johnson, Jr. (to be admitted *pro hac vice*)
Allison K. Young (to be admitted *pro hac vice*)
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Square, Suite 700
3000 El Camino Real
Palo Alto, CA 94306
(650) 843-4000
(650) 843-4001 (facsimile)
djohnson@morganlewis.com
allison.young@morganlewis.com

Attorneys for Plaintiff University of Pittsburgh

Case 2:07-cv-00025-AJSD Doc# 2756-2 Filed 04/13/2007 Page 1 of 3

OJS 44 (Rev. 11-04)

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON THE REVERSE OF THE FORM.)

I. (a) PLAINTIFFS UNIVERSITY OF PITTSBURGH		DEFENDANTS VARIAN MEDICAL SYSTEMS, INC.																					
(b) County of Residence of First Listed Pittsburgh		County of Residence of First Listed Defendant																					
<p><i>(EXCEPT IN U.S. PLAINTIFF CASES)</i></p> <p>Christopher K. Ramsey, Morgan Lewis & Bockius, One Oxford Centre, Pgh., PA 15219</p> <p>(c) Attorneys David W. Marston Jr., Morgan, Lewis & Bockius LLP, 1701 Market St Philadelphia, PA 19103, (215) 963-5937;</p> <p>(Firm Name, Address, and Telephone Number)</p>		<p><i>(IN U.S. PLAINTIFF CASES ONLY)</i></p> <p>NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE LAND INVOLVED</p> <p>Attorneys</p>																					
		Attorneys (If Known)																					
II. BASIS OF JURISDICTION (Place an "X" in One Box Only)		III. CITIZENSHIP OF PRINCIPAL PARTIES (For Diversity Cases Only)																					
<input type="checkbox"/> 1 U.S. Government Plaintiff	<input checked="" type="checkbox"/> 3 Federal Question <small>(U.S. Government Not a Party)</small>	Citizen of This State <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2	Incorporated or Principal Place of Business in This State <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 5																				
<input type="checkbox"/> 2 U.S. Government Defendant	<input checked="" type="checkbox"/> 4 Diversity <small>(Indicate Citizenship of Parties in Item II)</small>	Citizen of Another State <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3	Incorporated and Principal Place of Business in Another State <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6																				
		Citizen or Subject of a Foreign Country <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4	Foreign Nation <input type="checkbox"/> 6 <input checked="" type="checkbox"/> 7																				
IV. NATURE OF SUIT (Place an "X" in One Box Only)		(Place an "X" in One Box Only)																					
<table border="1"> <tr> <td>CONTRACT</td> <td>TORTS</td> <td>FORFEITURE/PENALTY</td> <td>BANKRUPTCY</td> <td>OTHER STATUTES</td> </tr> <tr> <td> 110 Insurance 120 Marine 130 Miller Act 140 Negotiable Instrument 150 Recovery of Overpayment & Enforcement of Judgment 151 Medicare Act 152 Recovery of Defaulted Student Loans (Excl. Veterans) 153 Recovery of Overpayment of Veteran's Benefits 160 Stockholders' Suits 190 Other Contract 195 Contract Product Liability 196 Franchise </td> <td> PERSONAL INJURY 310 Airplane 315 Airplane Product Liability 320 Assault, Libel & Slander 330 Federal Employers' Liability 340 Marine 345 Marine Product Liability 350 Motor Vehicle 355 Motor Vehicle Product Liability 360 Other Personal Injury </td> <td> PERSONAL INJURY 362 Personal Injury - Med. Malpractice 365 Personal Injury - Product Liability 368 Asbestos Personal Injury Product Liability 370 Other Fraud 371 Truth in Lending 380 Other Personal Property Damage 385 Property Damage Product Liability </td> <td> 422 Appeal 28 USC 158 423 Withdrawal 28 USC 157 </td> <td> 400 State Reapportionment 410 Antitrust 430 Banks and Banking 450 Commerce 460 Deportation 470 Racism, Influenced and Corrupt Organizations 480 Consumer Credit 490 Cable/Sat TV 810 Selective Service 850 Securities/Commodities/ Exchange 875 Customer Challenge 12 USC 3410 </td> </tr> <tr> <td>REAL PROPERTY</td> <td>CIVIL RIGHTS</td> <td>PRISONER PETITIONS</td> <td>SOCIAL SECURITY</td> <td> 861 HIA (13950) 862 Black Lung (923) 863 DIW C/DIW (405(g)) 864 SSDI Title XVI 865 RSI(405(g)) </td> </tr> <tr> <td> 210 Land Condemnation 220 Foreclosure 230 Rent Lease & Ejectment 240 Torts to Land 245 Tort Product Liability 260 All Other Real Property </td> <td> 411 Voting 442 Employment 443 Housing/ Accommodations 444 Welfare 445 Amer. w/Disabilities - Employment 446 Amer. w/Disabilities - Other 440 Other Civil Rights </td> <td> 510 Motions to Vacate Sentence Habeas Corpus: 530 General 535 Death Penalty 540 Mandamus & Other 550 Civil Rights 555 Prison Condition </td> <td> 710 Fair Labor Standards Act 720 Labor/Mgmt. Relations 730 Labor/Mgmt Reporting & Disclosure Act 740 Railway Labor Act 750 Other Labor Litigation 791 Empl. Ret. Inc. Security Act </td> <td> 870 Taxes (U.S. Plaintiff or Defendant) 871 IRS-Third Party 26 USC 7609 </td> </tr> </table>		CONTRACT	TORTS	FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES	110 Insurance 120 Marine 130 Miller Act 140 Negotiable Instrument 150 Recovery of Overpayment & Enforcement of Judgment 151 Medicare Act 152 Recovery of Defaulted Student Loans (Excl. Veterans) 153 Recovery of Overpayment of Veteran's Benefits 160 Stockholders' Suits 190 Other Contract 195 Contract Product Liability 196 Franchise	PERSONAL INJURY 310 Airplane 315 Airplane Product Liability 320 Assault, Libel & Slander 330 Federal Employers' Liability 340 Marine 345 Marine Product Liability 350 Motor Vehicle 355 Motor Vehicle Product Liability 360 Other Personal Injury	PERSONAL INJURY 362 Personal Injury - Med. Malpractice 365 Personal Injury - Product Liability 368 Asbestos Personal Injury Product Liability 370 Other Fraud 371 Truth in Lending 380 Other Personal Property Damage 385 Property Damage Product Liability	422 Appeal 28 USC 158 423 Withdrawal 28 USC 157	400 State Reapportionment 410 Antitrust 430 Banks and Banking 450 Commerce 460 Deportation 470 Racism, Influenced and Corrupt Organizations 480 Consumer Credit 490 Cable/Sat TV 810 Selective Service 850 Securities/Commodities/ Exchange 875 Customer Challenge 12 USC 3410	REAL PROPERTY	CIVIL RIGHTS	PRISONER PETITIONS	SOCIAL SECURITY	861 HIA (13950) 862 Black Lung (923) 863 DIW C/DIW (405(g)) 864 SSDI Title XVI 865 RSI(405(g))	210 Land Condemnation 220 Foreclosure 230 Rent Lease & Ejectment 240 Torts to Land 245 Tort Product Liability 260 All Other Real Property	411 Voting 442 Employment 443 Housing/ Accommodations 444 Welfare 445 Amer. w/Disabilities - Employment 446 Amer. w/Disabilities - Other 440 Other Civil Rights	510 Motions to Vacate Sentence Habeas Corpus: 530 General 535 Death Penalty 540 Mandamus & Other 550 Civil Rights 555 Prison Condition	710 Fair Labor Standards Act 720 Labor/Mgmt. Relations 730 Labor/Mgmt Reporting & Disclosure Act 740 Railway Labor Act 750 Other Labor Litigation 791 Empl. Ret. Inc. Security Act	870 Taxes (U.S. Plaintiff or Defendant) 871 IRS-Third Party 26 USC 7609	LABOR FEDERAL TAX SUITS	
CONTRACT	TORTS	FORFEITURE/PENALTY	BANKRUPTCY	OTHER STATUTES																			
110 Insurance 120 Marine 130 Miller Act 140 Negotiable Instrument 150 Recovery of Overpayment & Enforcement of Judgment 151 Medicare Act 152 Recovery of Defaulted Student Loans (Excl. Veterans) 153 Recovery of Overpayment of Veteran's Benefits 160 Stockholders' Suits 190 Other Contract 195 Contract Product Liability 196 Franchise	PERSONAL INJURY 310 Airplane 315 Airplane Product Liability 320 Assault, Libel & Slander 330 Federal Employers' Liability 340 Marine 345 Marine Product Liability 350 Motor Vehicle 355 Motor Vehicle Product Liability 360 Other Personal Injury	PERSONAL INJURY 362 Personal Injury - Med. Malpractice 365 Personal Injury - Product Liability 368 Asbestos Personal Injury Product Liability 370 Other Fraud 371 Truth in Lending 380 Other Personal Property Damage 385 Property Damage Product Liability	422 Appeal 28 USC 158 423 Withdrawal 28 USC 157	400 State Reapportionment 410 Antitrust 430 Banks and Banking 450 Commerce 460 Deportation 470 Racism, Influenced and Corrupt Organizations 480 Consumer Credit 490 Cable/Sat TV 810 Selective Service 850 Securities/Commodities/ Exchange 875 Customer Challenge 12 USC 3410																			
REAL PROPERTY	CIVIL RIGHTS	PRISONER PETITIONS	SOCIAL SECURITY	861 HIA (13950) 862 Black Lung (923) 863 DIW C/DIW (405(g)) 864 SSDI Title XVI 865 RSI(405(g))																			
210 Land Condemnation 220 Foreclosure 230 Rent Lease & Ejectment 240 Torts to Land 245 Tort Product Liability 260 All Other Real Property	411 Voting 442 Employment 443 Housing/ Accommodations 444 Welfare 445 Amer. w/Disabilities - Employment 446 Amer. w/Disabilities - Other 440 Other Civil Rights	510 Motions to Vacate Sentence Habeas Corpus: 530 General 535 Death Penalty 540 Mandamus & Other 550 Civil Rights 555 Prison Condition	710 Fair Labor Standards Act 720 Labor/Mgmt. Relations 730 Labor/Mgmt Reporting & Disclosure Act 740 Railway Labor Act 750 Other Labor Litigation 791 Empl. Ret. Inc. Security Act	870 Taxes (U.S. Plaintiff or Defendant) 871 IRS-Third Party 26 USC 7609																			
V. ORIGIN (Place an "X" in One Box Only)			Transferred from another district (specify)	Multidistrict Litigation	Appeal to District Judge from Magistrate Judgment																		
<input checked="" type="checkbox"/> 1 Original Proceeding	<input type="checkbox"/> 2 Removed from State Court	<input type="checkbox"/> 3 Remanded from Appellate Court	<input type="checkbox"/> 4 Reinstated or Reopened	<input type="checkbox"/> 5																			
VI. CAUSE OF ACTION		Cite the U.S. Civil Statute under which you are filing (Do not cite jurisdictional statutes unless diversity): 35 U.S.C. § 271																					
		Brief description of cause: Patent infringement action																					
VII. REQUESTED IN COMPLAINT:		<input type="checkbox"/> CHECK IF THIS IS A CLASS ACTION UNDER F.R.C.P. 23		DEMAND \$	CHECK YES only if demanded in complaint: JURY DEMAND: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																		
VIII. RELATED CASE(S) IF ANY		(See instructions): JUDGE		DOCKET NUMBER																			
DATE April 13, 2007		SIGNATURE OF ATTORNEY OF RECORD /s/ Christopher K. Ramsey																					
FOR OFFICE USE ONLY																							

RECEIPT #	AMOUNT	APPLYING IFFP	JUDGE	MAG. JUDGE
-----------	--------	---------------	-------	------------

JS 44 AREvised OCTOBER, 1993

IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF PENNSYLVANIA

THIS CASE DESIGNATION SHEET MUST BE COMPLETED

PART A

This case belongs on the Erie Johnstown Pittsburgh) calendar.1. **ERIE CALENDAR - If cause of action arose in the counties of Crawford, Elk, Erie, Forest, McKean, Venango or Warren, OR any plaintiff or defendant resides in one of said counties.**2. **JOHNSTOWN CALENDAR - If cause of action arose in the counties of Bedford, Blair, Cambria, Clearfield or Somerset OR any plaintiff or defendant resides in one of said counties.**3. Complete if on ERIE CALENDAR: I certify that the cause of action arose in _____ County and
that the _____ resides in _____ County.4. Complete if on JOHNSTOWN CALENDAR: I certify that the cause of action arose in _____ County
and that the _____ resides in _____ County.

PART B (You are to check ONE of the following)

1. This case is related to Number _____ Judge _____
 2. This case is not related to a pending or terminated case.

DEFINITIONS OF RELATED CASES:

CIVIL: Civil cases are deemed related when a case filed relates to property included in another suit or involves the same issues of fact or it grows out of the same transactions as another suit or involves the validity or infringement of a patent involved in another suit**EMINENT DOMAIN:** Cases in contiguous closely located groups and in common ownership groups which will lend themselves to consolidation for trial shall be deemed related.**HABEAS CORPUS & CIVIL RIGHTS:** All habeas corpus petitions filed by the same individual shall be deemed related. All pro se Civil Rights actions by the same individual shall be deemed related.

PART C

1. CIVIL CATEGORY (Place x in only applicable category).

1. Antitrust and Securities Act Cases
2. Labor-Management Relations
3. Habeas Corpus
4. Civil Rights
5. Patent, Copyright, and Trademark
6. Eminent Domain
7. All other federal question cases
8. All personal and property damage tort cases, including maritime, FELA, Jones Act, Motor vehicle, products liability, assault, defamation, malicious prosecution, and false arrest
9. Insurance indemnity, contract and other diversity cases.
10. Government Collection Cases (shall include HEW Student Loans (Education), VA Overpayment, Overpayment of Social Security, Enlistment Overpayment (Army, Navy, etc.), HUD Loans, GAO Loans (Misc. Types), Mortgage Foreclosures, SBA Loans, Civil Penalties and Coal Mine Penalty and Reclamation Fees.)

I certify that to the best of my knowledge the entries on this Case Designation Sheet are true and correct

DATE April 13, 2007 ATTORNEY ATTORNEY AT LAW

NOTE: ALL SECTIONS OF BOTH SIDES MUST BE COMPLETED BEFORE CASE CAN BE PROCESSED.

JS 44 Reverse (Rev. 11/04)

INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS 44

Authority For Civil Cover Sheet

The JS 44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently, a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. The attorney filing a case should complete the form as follows:

I. **(a) Plaintiffs-Defendants.** Enter names (last, first, middle initial) of plaintiff and defendant. If the plaintiff or defendant is a government agency, give only the full name or standard abbreviations. If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title.

(b) County of Residence. For each civil case filed, except U.S. plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing. In U.S. plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing. (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved.)

(c) Attorneys. Enter the firm name, address, telephone number, and attorney of record. If there are several attorneys, list them on an attachment, noting in this section "(see attachment)".

II. **Jurisdiction.** The basis of jurisdiction is set forth under Rule 8(a), F.R.C.P., which requires that jurisdictions be shown in pleadings. Place an "X" in one of the boxes. If there is more than one basis of jurisdiction, precedence is given in the order shown below. United States plaintiff. (1) Jurisdiction based on 28 U.S.C. 1345 and 1348. Suits by agencies and officers of the United States are included here.

United States defendant. (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box.

Federal question. (3) This refers to suits under 28 U.S.C. 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States. In cases where the U.S. is a party, the U.S. plaintiff or defendant code takes precedence, and box 1 or 2 should be marked.

Diversity of citizenship. (4) This refers to suits under 28 U.S.C. 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked. (See Section III below; federal question actions take precedence over diversity cases.)

III. **Residence (citizenship) of Principal Parties.** This section of the JS 44 is to be completed if diversity of citizenship was indicated above. Mark this section for each principal party.

IV. **Nature of Suit.** Place an "X" in the appropriate box. If the nature of suit cannot be determined, be sure the cause of action, in Section below, is sufficient to enable the deputy clerk or the statistical clerks in the Administrative Office to determine the nature of suit. If the cause fits more than one nature of suit, select the most definitive.

V. **Origin.** Place an "X" in one of the seven boxes.

Original Proceedings. (1) Cases which originate in the United States district courts. Removed from State Court. (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U.S.C., Section 1441. When the petition for removal is granted, check this box.

Remanded from Appellate Court. (3) Check this box for cases remanded to the district court for further action. Use the date of remand as the filing date.

Reinstated or Reopened. (4) Check this box for cases reinstated or reopened in the district court. Use the reopening date as the filing date. Transferred from Another District. (5) For cases transferred under Title 28 U.S.C. Section 1404(a). Do not use this for within district transfers or multidistrict litigation transfers.

Multidistrict Litigation. (6) Check this box when a multidistrict case is transferred into the district under authority of Title 28 U.S.C. Section 1407. When this box is checked, do not check (5) above.

Appeal to District Judge from Magistrate Judgment. (7) Check this box for an appeal from a magistrate judge's decision.

VI. **Cause of Action.** Report the civil statute directly related to the cause of action and give a brief description of the cause. **Do not cite jurisdictional statutes unless diversity.** Example: U.S. Civil Statute: 47 USC 553
Brief Description: Unauthorized reception of cable

VII. **Requested in Complaint.** Class Action. Place an "X" in this box if you are filing a class action under Rule 23, F.R.Cv.P.

Demand. In this space enter the dollar amount (in thousands of dollars) being demanded or indicate other demand such as a preliminary injunction.

Jury Demand. Check the appropriate box to indicate whether or not a jury is being demanded.
VIII. **Related Cases.** This section of the JS 44 is used to reference related pending cases if any. If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases.

Date and Attorney Signature. Date and sign the civil cover sheet.

UNITED STATES
DISTRICT COURT
WESTERN DISTRICT OF PENNSYLVANIA
PITTSBURGH Division

07003692 - EA
April 13, 2007

Code	Case #	Qty	Amount
CIVIL FI	07-491	1 0	350.00
			350.00 CC
TOTAL →			350.00

FROM: MORGAN LEWIS & BOCKIUS
ONE OXFORD CENTRE
32ND FLOOR
PITTSBURGH PA 15222

EXHIBIT A

**United States Patent [19]**

Kalend et al.

[11] Patent Number: **5,727,554**
 [45] Date of Patent: **Mar. 17, 1998**

[54] APPARATUS RESPONSIVE TO MOVEMENT OF A PATIENT DURING TREATMENT/DIAGNOSIS

[75] Inventors: Andre M. Kalend, Monroeville; Joel Greenberger, Sewickley; Karun B. Shimoga, Pittsburgh; Charalambos N. Athanassiou, Pittsburgh; Takeo Kanade, Pittsburgh, all of Pa.

[73] Assignee: University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

[21] Appl. No.: 715,834

[22] Filed: Sep. 19, 1996

[51] Int. Cl⁶ A61B 6/00

[52] U.S. Cl. 128/653.1

[58] Field of Search 128/630, 653.1, 128/660.03; 364/413.02, 413.13, 413.25, 413.26; 356/375; 378/69, 205

[56] References Cited**U.S. PATENT DOCUMENTS**

4,466,075	8/1984	Groch et al.	..... 364/413.26 X
5,080,100	1/1992	Trotel	..... 128/653.1
5,103,823	4/1992	Acharya et al.	..... 128/653.1
5,214,711	5/1993	Neely et al.	..... 364/413.27 X
5,295,483	3/1994	Nowacki et al.	..... 128/660.03
5,389,101	2/1995	Heilbrun et al.	..... 128/653.1 X
5,398,684	3/1995	Hardy	..... 128/653.1
5,446,548	8/1995	Genig et al.	..... 128/653.1 X
5,482,042	1/1996	Fujita	..... 128/653.1
5,558,430	9/1996	Bova et al.	..... 128/653.1

OTHER PUBLICATIONS

Active Shape Models—'Smart Snakes', T.F. Cootes and C.J. Taylor, pp. 267-275, Proceedings of European Conference on Computer Vision, Genoa, Italy, 1992.

Training Models of Shape from Sets of Examples, T.F. Cootes, C.J. Taylor, D.H. Cooper, and J. Graham, pp. 8-18, Proceedings of European Conference on Computer Vision, Genoa, Italy, 1992.

A Computational Framework and an Algorithm for the Measurement of Visual Motion, P. Anandan, pp. 283-310, International Journal of Computer Vision, 2, 1989.

Feature Extraction from Faces Using Deformable Templates, A.L. Yuille, P.W. Hallinan, and D.S. Cohen, pp. 99-111, International Journal of Computer Vision, 8:2, 1992.

Computer and Robot Vision, vol. I, R. M. Haralick and L.G. Shapiro, pp. 328-353, Library of Congress Cataloging-in-Publication Data, 1992.

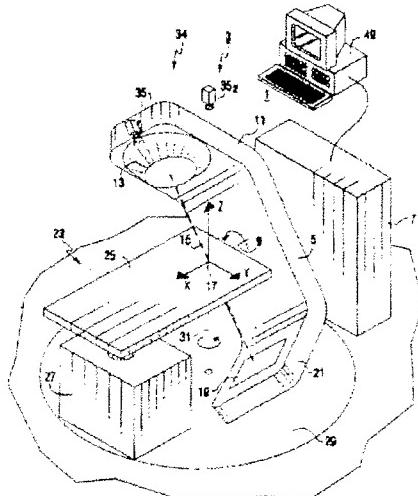
Motion Tracking with an Active Camera, D. Murray and A. Basu, pp. 449-459, IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 16, No. 5, May 1994.

Primary Examiner—Francis Jaworski
Attorney, Agent, or Firm—Richard V. Westerhoff; Eckert Seamans Cherin & Mellott, LLC

[57] ABSTRACT

A camera generates digital image signals representing an image of one or more natural or artificial fiducials on a patient positioned on treatment or diagnosis equipment. A processor applies multiple levels of filtering at multiple levels of resolution to repetitively determine successive fiducial positions. A warning signal is generated if movement exceeds certain limits but is still acceptable for treatment. Unacceptable displacement results in termination of the treatment beam. Tracking templates can be generated interactively from a display of the digital image signals or through automatic selection of an image having the median correlation to an initial template. A gating signal synchronized to patient breathing can be extracted from the digital image signals for controlling the radiation beam generator.

22 Claims, 12 Drawing Sheets



U.S. Patent

Mar. 17, 1998

Sheet 1 of 12

5,727,554

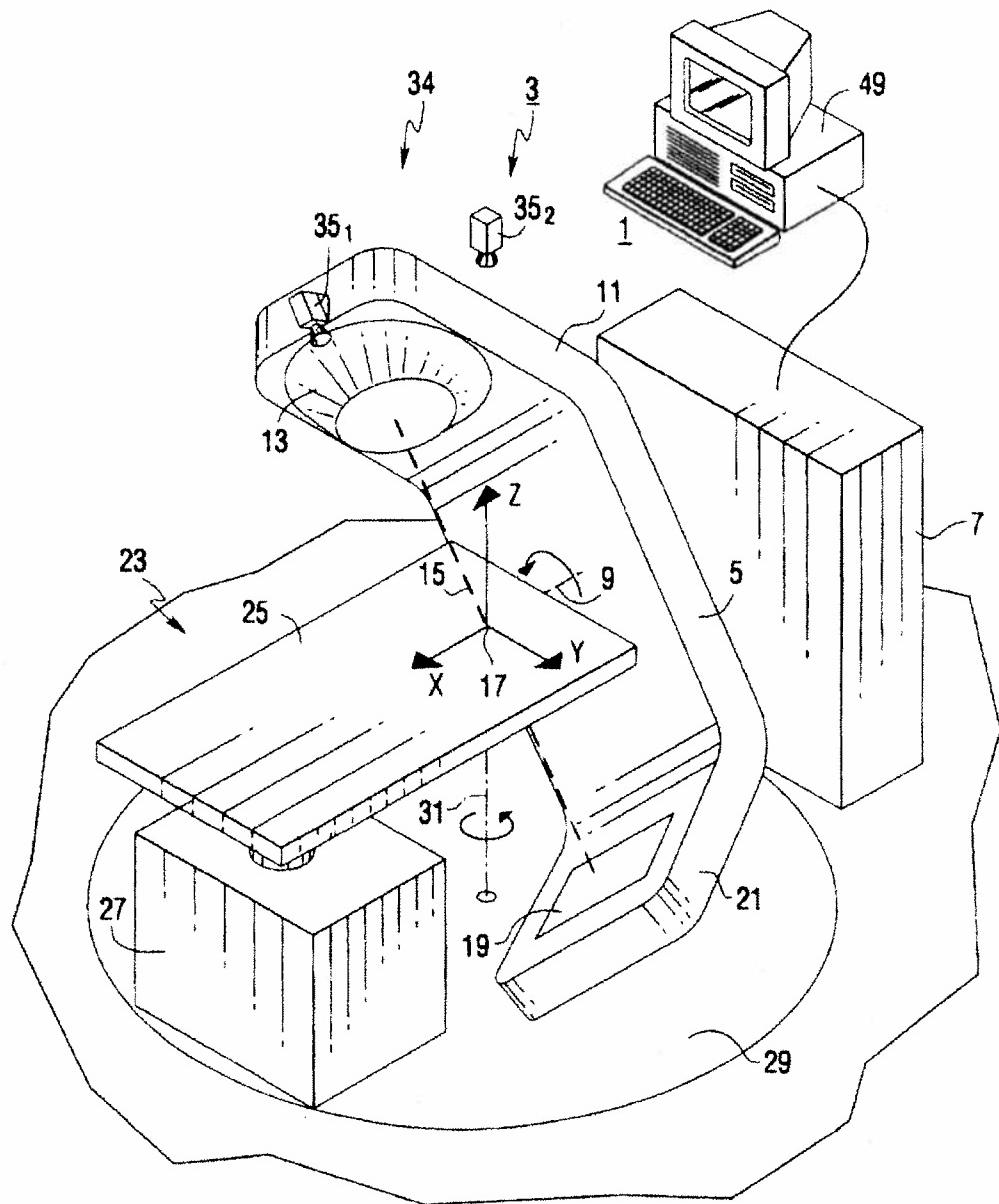


FIG. 1

U.S. Patent

Mar. 17, 1998

Sheet 2 of 12

5,727,554

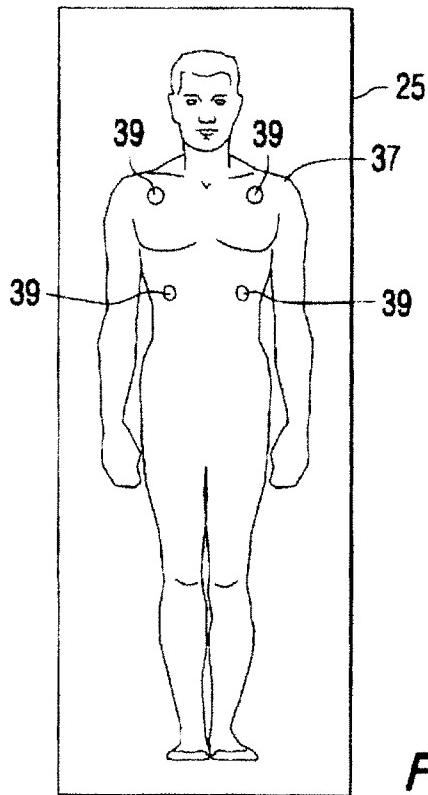


FIG. 2

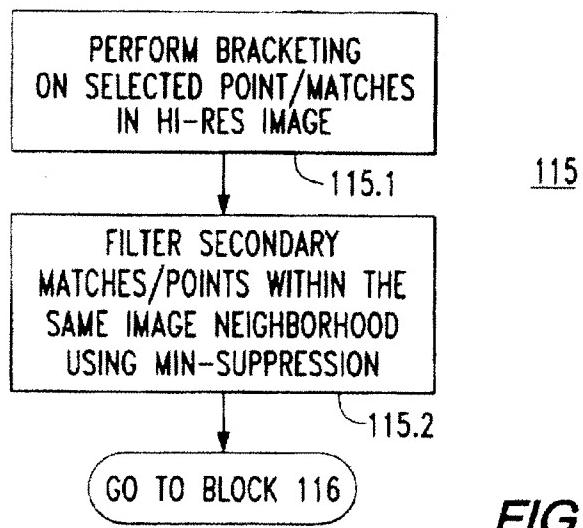


FIG. 9

U.S. Patent

Mar. 17, 1998

Sheet 3 of 12

5,727,554

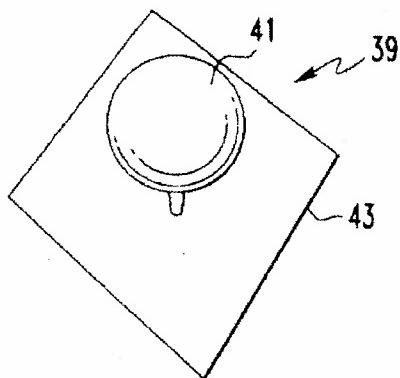
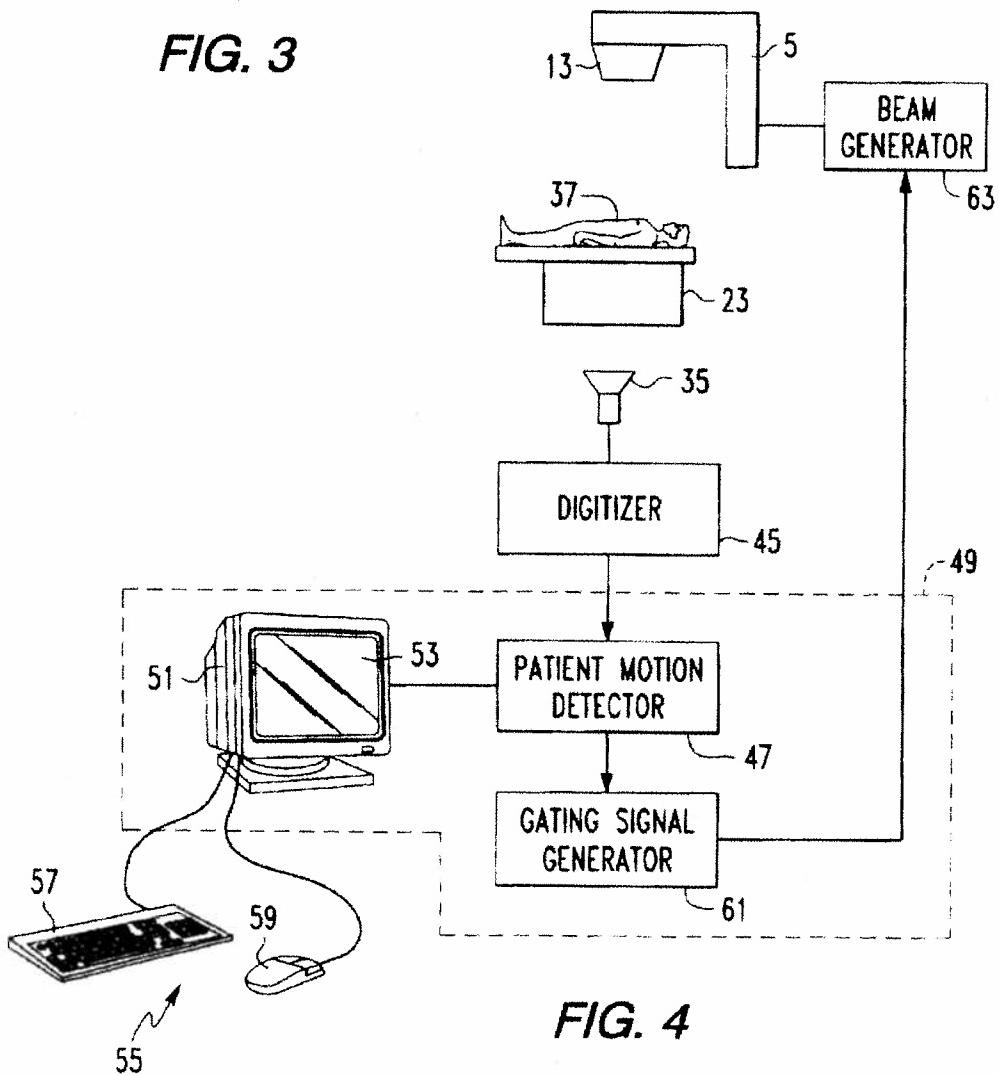


FIG. 3



U.S. Patent

Mar. 17, 1998

Sheet 4 of 12

5,727,554

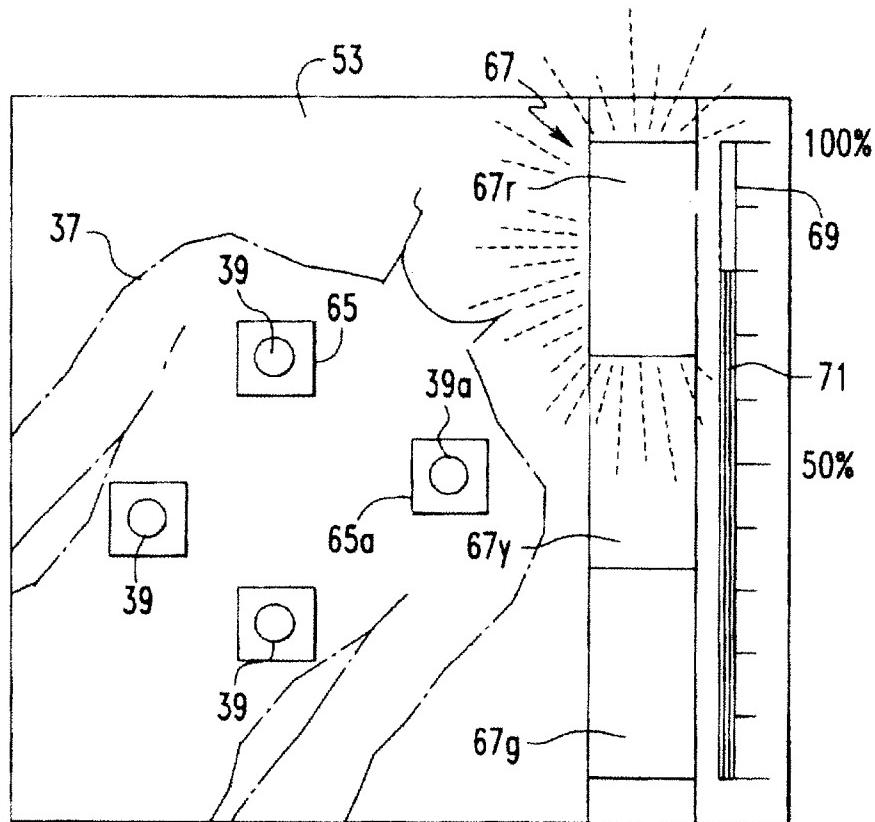


FIG. 5

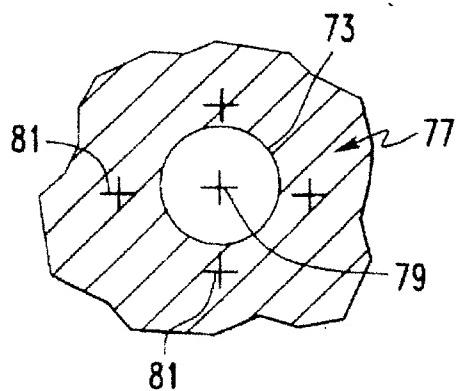


FIG. 17

U.S. Patent

Mar. 17, 1998

Sheet 5 of 12

5,727,554

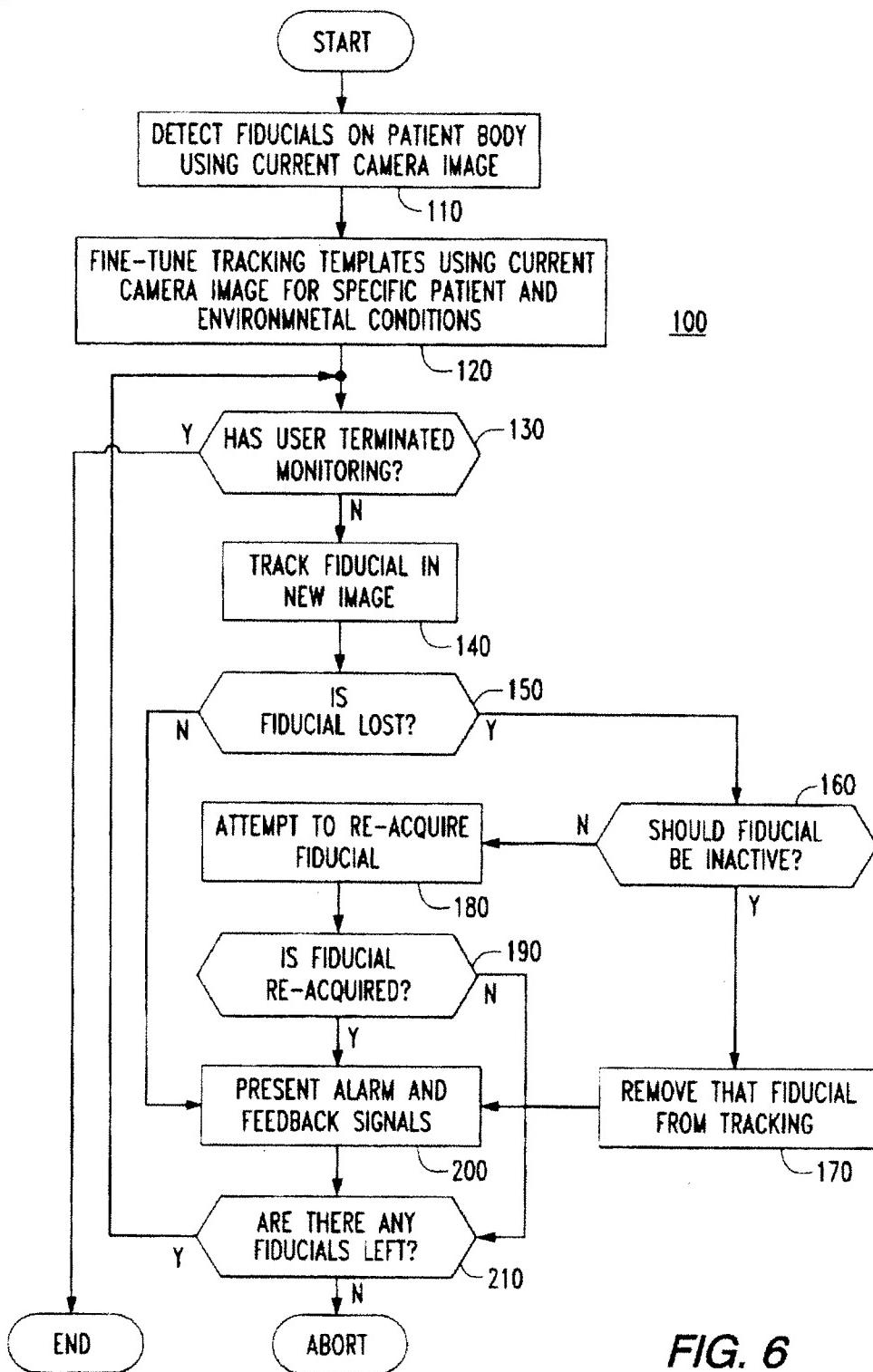


FIG. 6

U.S. Patent

Mar. 17, 1998

Sheet 6 of 12

5,727,554

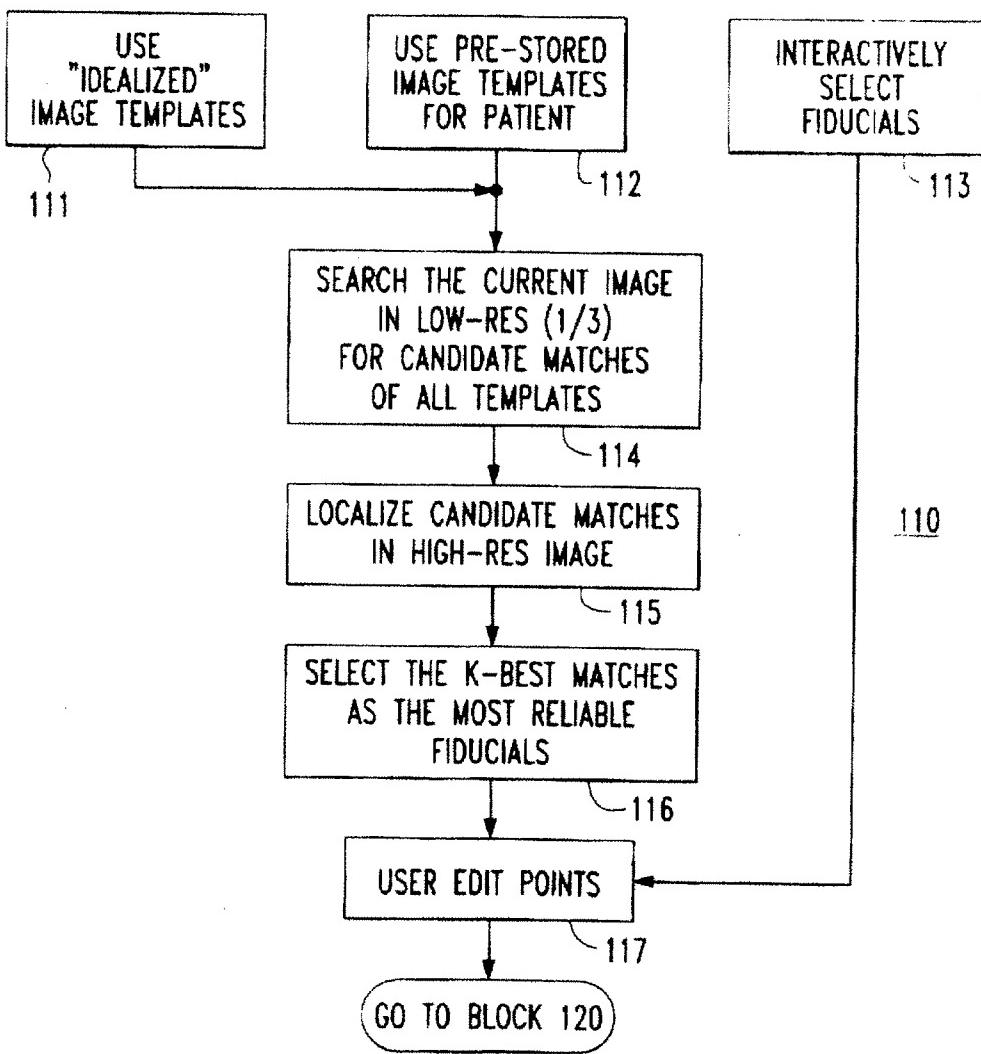


FIG. 7

U.S. Patent

Mar. 17, 1998

Sheet 7 of 12

5,727,554

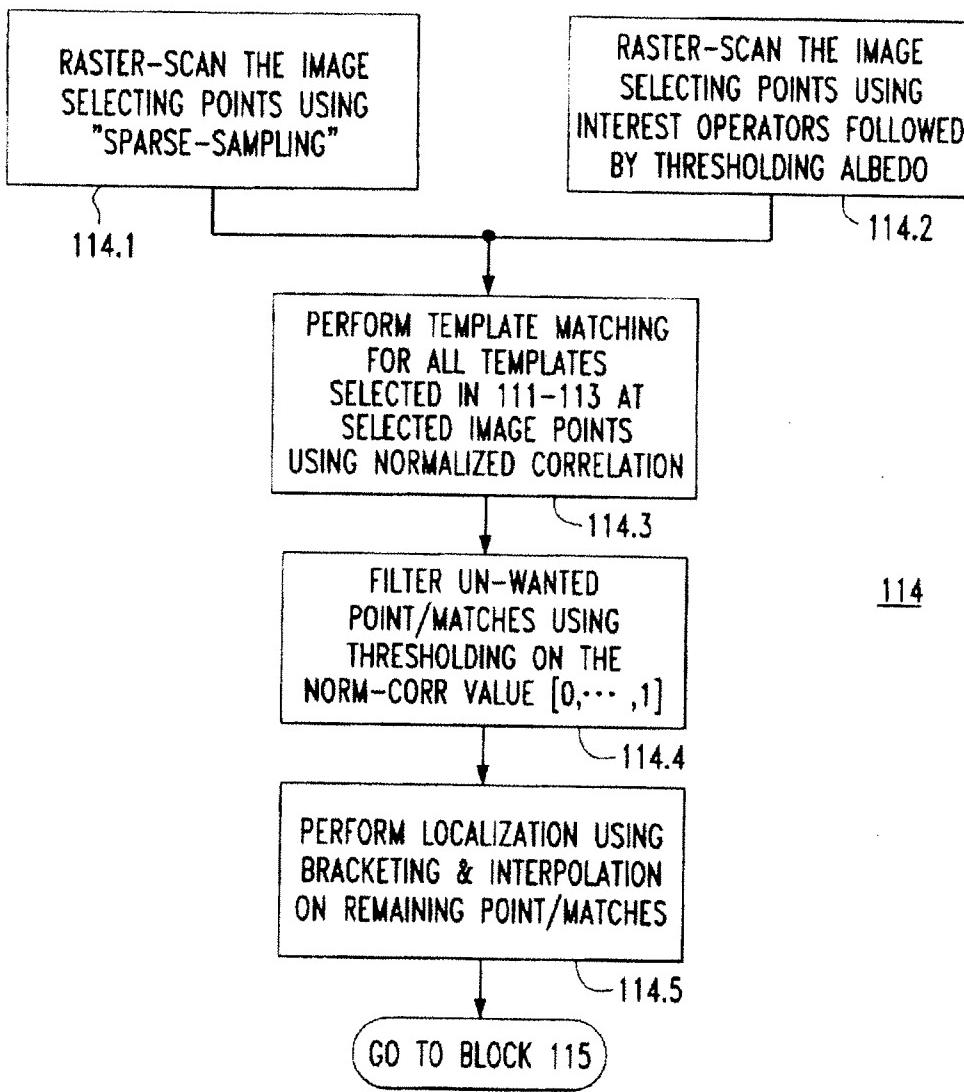


FIG. 8

U.S. Patent

Mar. 17, 1998

Sheet 8 of 12

5,727,554

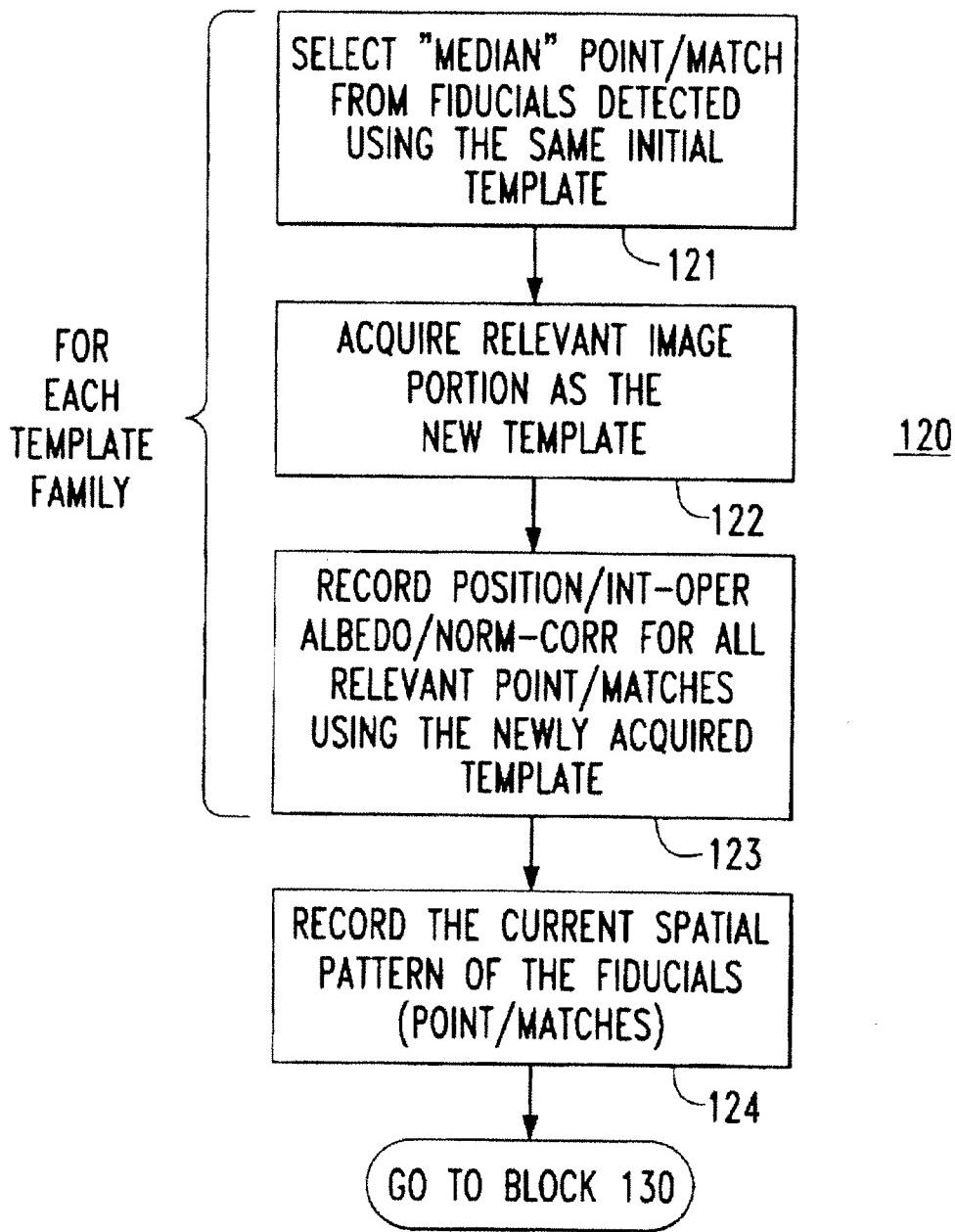


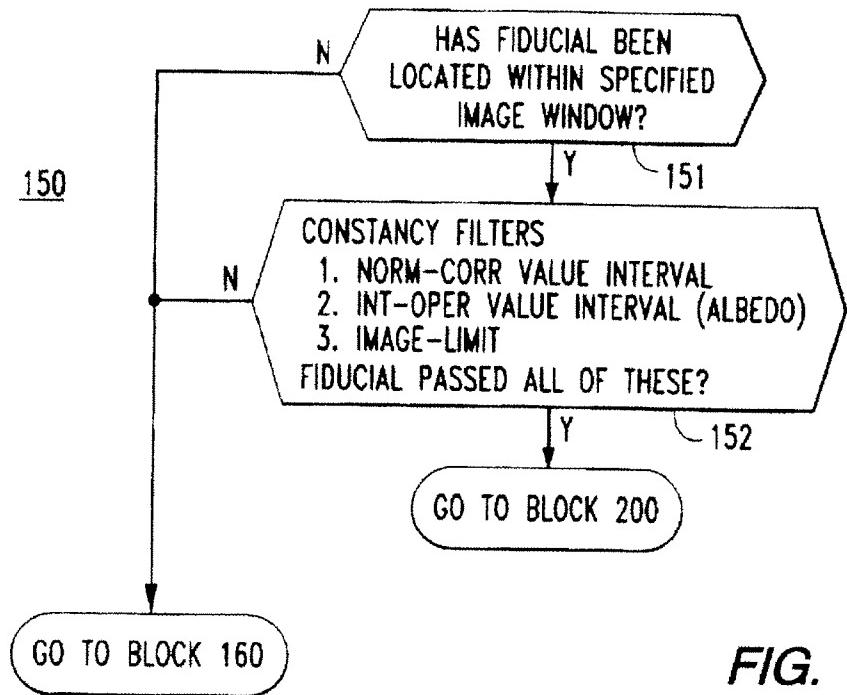
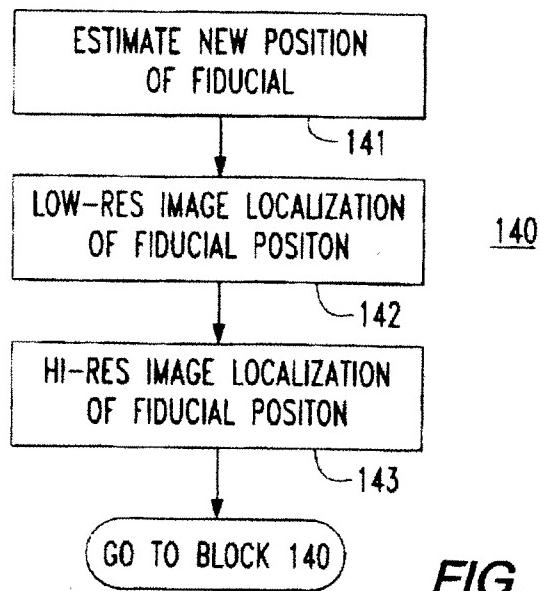
FIG. 10

U.S. Patent

Mar. 17, 1998

Sheet 9 of 12

5,727,554



U.S. Patent

Mar. 17, 1998

Sheet 10 of 12

5,727,554

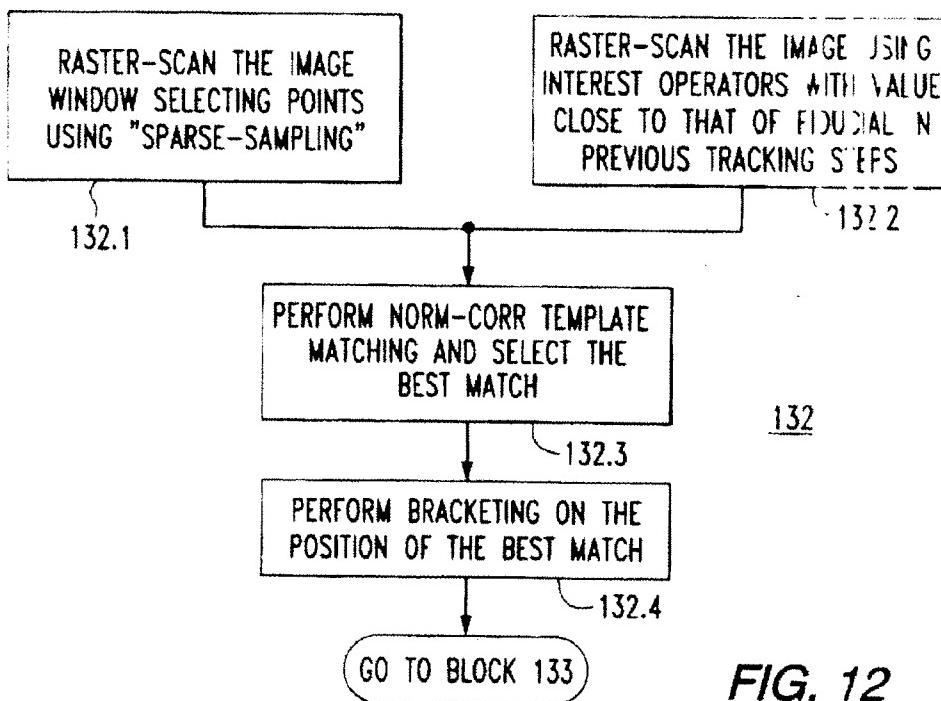


FIG. 12

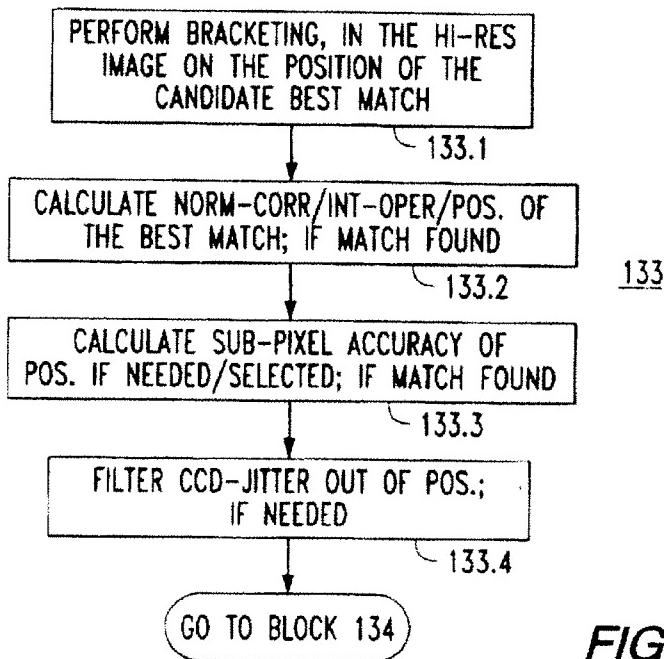


FIG. 13

U.S. Patent

Mar. 17, 1998

Sheet 11 of 12

5,727,554

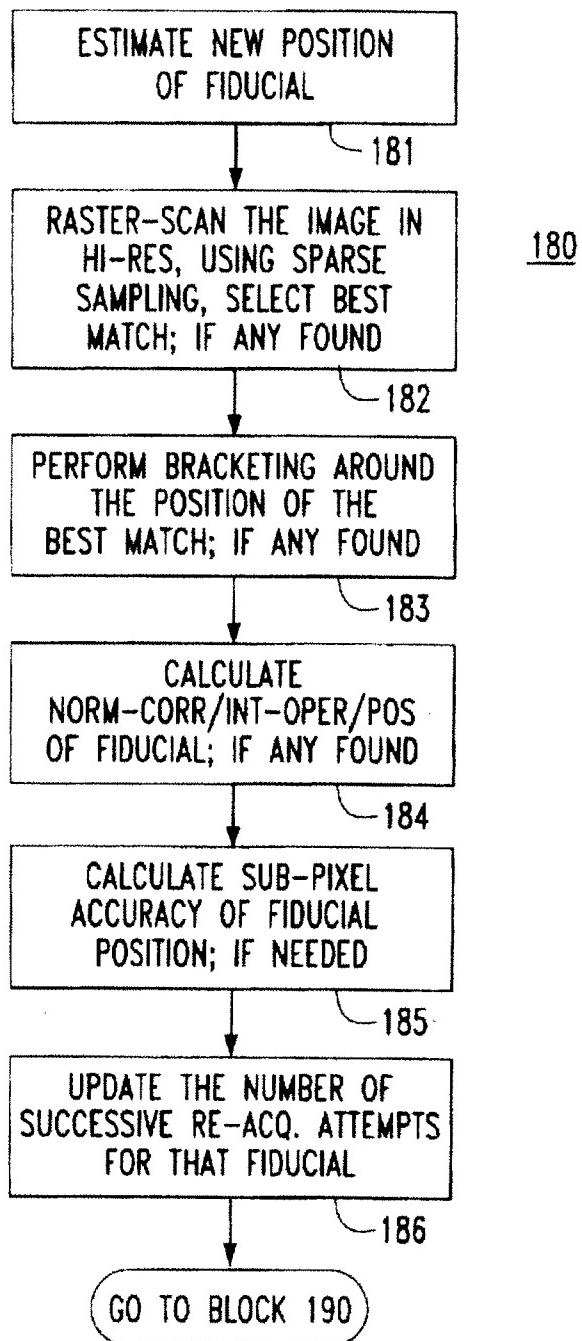


FIG. 15

U.S. Patent

Mar. 17, 1998

Sheet 12 of 12

5,727,554

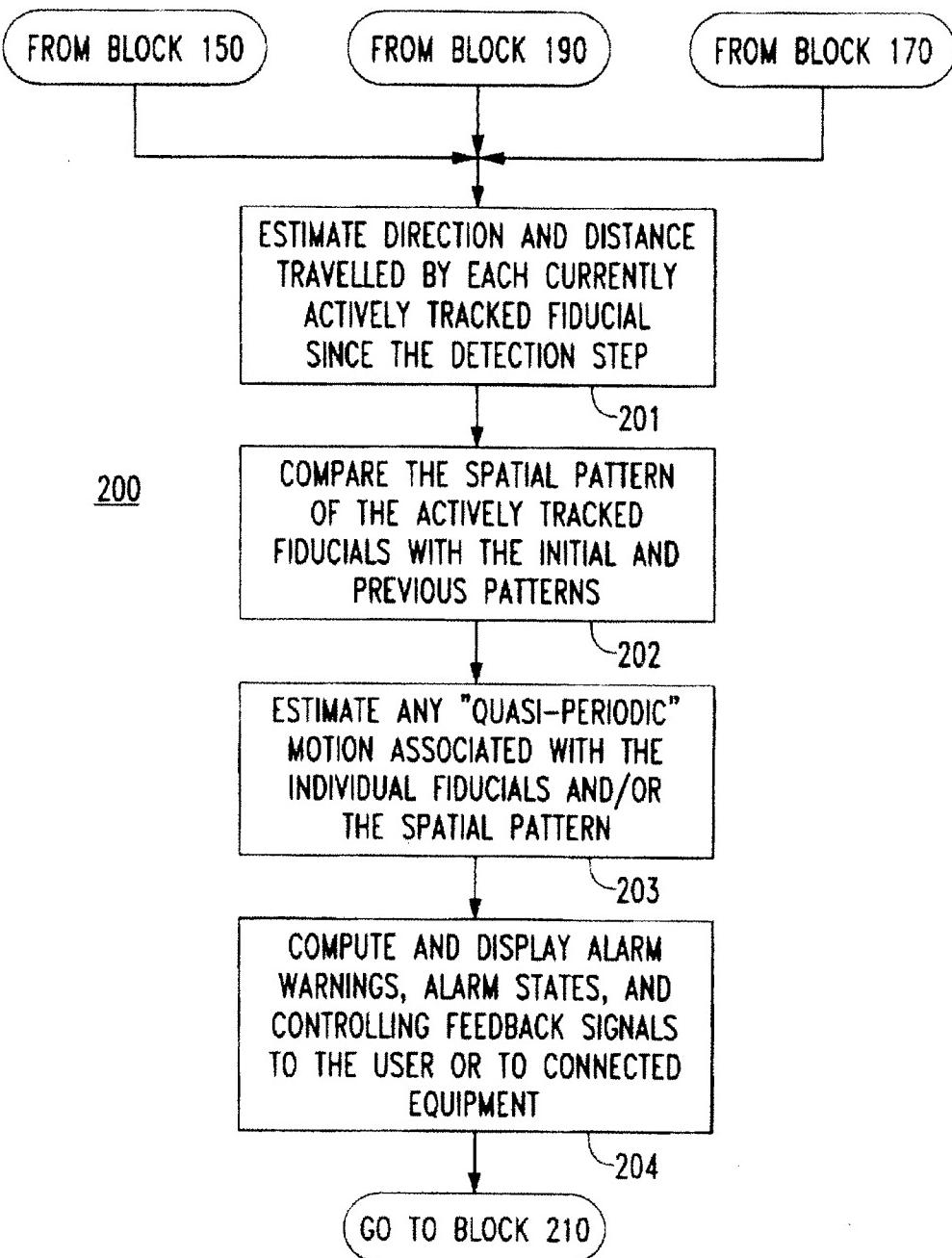


FIG. 16

5,727,554

1

2

**APPARATUS RESPONSIVE TO MOVEMENT
OF A PATIENT DURING TREATMENT/
DIAGNOSIS**

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to medical use of radiation for treatment and diagnosis, and more particularly to detection and response to patient movement during radiological treatment and diagnosis.

2. Background Information

Conventional radiotherapy treatment relies on simple patient setup techniques. These techniques use stationary and a limited number of radiation fields, which are often much wider than the tumor or volume, thus effectively compensating for the possibility of a tumor geometric miss. Consequently, a substantial amount of healthy tissue is irradiated and becomes a radio-biological dose limiting factor in tumor control.

Modern conformal dynamic radiotherapy attempts to overcome the above radio-biological limitation by tight-margin conformation of radiation dose distribution tailored to the three-dimensional tumor volume by the use of computer-control multibeam conformal dynamic radiotherapy (CCRT). Consequently, the accuracy in patient position, knowledge of the movement of a patient including substantial motion of internal organs such as with breathing is of primary importance. In addition to patient movement which would cause the tight beam to miss the tumor, it is important to be able to detect patient movement which could cause a collision between the patient and the linear accelerator, which is repeatedly repositioned to establish the multiple treatment beams.

There is a need therefore for apparatus for detecting patient movement on radiological treatments/diagnostic equipment.

There is a particular need for such apparatus which can detect submillimeter patient movement in real time.

There is also a need for such apparatus which can detect patient movement initiated from various treatment positions.

There is also a need for such apparatus which can detect patient movement under varying lighting conditions.

There is a further need for such apparatus which can discriminate movement associated with patient breathing from other movement and accommodate therefor.

SUMMARY OF THE INVENTION

These needs and others are satisfied by the invention which is directed to apparatus responsive to movement of a patient which identifies and tracks movement of at least one passive fiducial on the patient. The apparatus applies multiple levels of filtering which can include: correlation, preferably normalized correlation, sparse sampling, bracketing and interpolation, and minima suppression to rapidly identify the location of the at least one fiducial. The multiple levels of filtering are applied at multiple levels of resolution of the digital image signals.

Interest operators can be used in combination with templates to locate the positions of the passive fiducials. The templates can be selected interactively by a user from a display generated by the digital image signals. Alternatively, the template used for tracking is selected from images generated using an initial template. Rather than using the image which best matches the initial template, the template with a median match is selected.

As another aspect of the invention, the means generating an output includes means indicating movement of the at least one passive fiducial relative to at least one selected level of displacement. Preferably, the output means generates a warning that movement exceeds a first displacement and includes means providing a signal for terminating radiation treatment when the movement exceeds a second greater displacement. Preferably, the means providing an indication of movement includes a display generating an image of the patient and the fiducials, together with an indication of movement relative to the first and second displacements.

As yet another aspect of the invention, the means determining movement of the passive fiducials includes means detecting movement associated with patient breathing and random movement. The movement associated with patient breathing can be used to generate a gating signal synchronized to patient breathing. This gating signal can then be used to actuate the beam generator only during selected parts of the breathing cycle.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following description of the preferred embodiments when read in conjunction with the accompanying drawings in which:

FIG. 1 is an isometric view of apparatus in accordance with the invention for implementing conformal dynamic radiotherapy.

FIG. 2 is a plan view of a patient reclining on a couch which forms part of the apparatus of FIG. 1 and illustrating the placement of fiducials in accordance with the invention.

FIG. 3 is a perspective view of a preferred fiducial used in implementation of the invention.

FIG. 4 is a functional diagram illustrating implementation of the invention.

FIG. 5 is an illustration of a display which is generated by the apparatus of FIG. 1 in implementation of the invention.

FIGS. 6-16 are flow charts of software used in implementation of the invention.

FIG. 17 is an illustration of an interest operator which can be used in implementation of the invention.

**DESCRIPTION OF THE PREFERRED
EMBODIMENT**

FIG. 1 illustrates a radiotherapy treatment system 1 in which the invention is implemented. This system 1 includes a machine 3 having a gantry 5 pivotally mounted on a machine base 7 for rotation about a horizontal axis 9. The gantry 5 has a first arm 11 carrying a collimator 13 which directs a beam of high energy radiation 15, such as a beam of high energy photons, along a path which is perpendicular to and passes through an extension of the axis of rotation 9. This intersection is referred to as the isocenter 17. In some machines, a portal imager 19 is mounted on a second arm 21 on the opposite end of the gantry in alignment with the radiation beam 15. The portal imager 19 records radiation which is not absorbed by the patient.

The isocenter 17 serves as the origin of a coordinate system for room space. As can be seen, the X axis coincides with the axis of rotation 9 of the gantry. Thus, as the gantry 5 rotates it defines a plane of treatment containing the Y and Z axes.

The machine 3 further includes a patient positioning assembly 23, which includes a couch 25 mounted on a

5,727,554

3

support 27 for vertical, lateral and longitudinal movement relative to the support. The support 27 is mounted on a turntable 29, which has its axis 31 vertically aligned under the isocenter 17 and concentric with the Z axis. With this arrangement, the patient positioning assembly 23 has four degrees of freedom: translation in the X, Y and Z axes of room space and rotation about the Z axis. Thus, the patient is not rotated about the longitudinal axis of the couch or tilted about a horizontal axis extending transversely through the couch. However, with the addition of rotation of the gantry in the Y-Z treatment plane, the radiation beam 15 can be directed through a patient reclining on the couch 25 in any desired direction. A computer 33 controls movement of the patient positioning assembly 23 and the gantry 5 for establishing the progression of high energy treatment beams used in practicing conformal radiation therapy.

As previously discussed, in conformal radiation therapy the beam 15 is tightly conformed by the collimator 13 to the specific tumor to be treated. Thus, movement of the patient on the couch 25 of the patient position assembly 23 can cause misalignment of the radiation beam 15 with the tumor. This not only degrades treatment of the tumor but also exposes surrounding healthy tissue to unwanted levels of radiation. In addition, normal breathing by the patient can cause movement of internal organs by an amount which would result in misalignment of the beam. For instance, a tumor on the lower portion of the lung can move several centimeters during normal breathing. Slight movement of the patient can be tolerated; however, treatment should be terminated if acceptable tolerances of movement are exceeded. Furthermore, excessive movement by the patient can also cause a collision between the patient and the gantry as the patient positioning assembly 23 and gantry are positioned for successive treatment beams.

The invention employs a vision system 34 to measure and respond to patient movement. The vision system 34 includes at least one video camera 35. Preferably, multiple cameras are used. In the exemplary embodiment of the invention a first camera 35₁ is mounted on the first arm 11 of the gantry 5 adjacent the collimator 13 and is aimed to capture an image of a patient 37 positioned on the couch 25, as shown in FIG. 2. As the camera 35₁ will be below the couch 25 for some positions of the gantry 5, a second camera 35₂ is fixed to the ceiling over the patient positioning assembly 23. The field of view of this camera 35₂ will be blocked when the gantry 5 is at the top of its arc. Thus, the patient is visible to at least one camera 35 at all times. Additional cameras 35 could be provided, such as cameras laterally displaced from the patient positioning assembly 23 to provide more sensitivity to movement along the axis of, for instance, the camera 35₂. However, as will be discussed below, a single camera can detect three-dimensional movement, including movement toward and away from the camera which is detected as a change in the size of the image.

In the exemplary embodiment of the invention, natural or artificial fiducials are used to detect patient movement. Natural fiducials could be scars or other prominent features of the patient. The preferred fiducial 39 shown in FIG. 3 is a sphere 41 covered with a material having a lambertian surface. Such a surface is highly reflective under low light conditions, yet provides a uniform scattered reflection with no highlights. The sphere 41 is attached to the center of a non-reflective base 43 which is secured to the patient's skin, such as by an adhesive.

In principle, only one fiducial 39 is required. As a practical matter, it is advantageous to provide multiple fiducials placed on the patient so as to detect any movement of the

4

critical locations. Thus, as shown in FIG. 2, by way of example, four fiducials 39 are placed on the patient's chest. Natural skin markings could be used in addition to the artificial fiducials shown in FIG. 3. If more than one camera 35 is used, each tracks as many of the fiducials 39 as it can see.

FIG. 4 is a functional diagram of the invention. The camera(s) 35 capture an image of the fiducials 39 on the patient 37 reclining on the patient positioning assembly 23. The image captured by the camera 35 is digitized by digitizer 45 to generate digital image signals. These digital image signals are 0 to 255 gray scale signals for each camera pixel. The digital image signals are processed by a processor which includes a patient motion detector 47. Patient motion detector 47 is implemented in the computer 49 shown in FIG. 1. The computer 49 includes a monitor 51 which generates a display 53, an example of which is shown in FIG. 5. The man machine interface 55 for the computer 49 includes a keyboard 57 and a pointing device 59, such as a mouse or trackball.

As will be discussed fully, the patient motion detector 47 detects and identifies the fiducials 39 and then tracks their movement. Movement within a certain narrow tolerance is acceptable, while larger movements are unacceptable. Visible and/or audio warnings of these two classifications of movement can be generated. A gating signal generator 61 responds to unacceptable movement to disable the beam generator 63. This unacceptable movement which would terminate the radiation beam can be movement which displaces the target tumor so that it is missed by the radiation beam, or could be movement which would cause a collision between the patient and the gantry 5 during movement of the machine from one treatment beam to the next. In the former case, the gating signal generator 61 could re-enable the beam generator, if the patient returns to the proper position. For instance, a large sigh could temporarily displace the target area by an unacceptable amount. In accordance with another aspect of the invention, the patient motion detector 47 can track patient breathing and extract such quasi-periodic motion from random patient motion. Gating of the beam generator can then be synchronized with patient breathing. For instance, a tumor on the lung could move up to 4 to 5 centimeters during patient breathing. This is an unacceptable amount of movement. However, by synchronizing generation of the radiation beam with breathing, the tumor can be repetitively irradiated at a fixed position during the breathing cycle.

As shown in FIG. 5, the display 53 presents an image of the patient 37 with the fiducials 39 appearing prominently. An indicator 65, such as the square shown, surrounds each fiducial and is color coded to indicate the state of motion of the fiducial. The fiducial with the largest displacement such as 39a is singled out by a distinctive marker, such as a red square 65a, while the remaining markers are green squares in the exemplary system. The display also includes a traffic light 67 having a green section 67g, a yellow section 67y and a red section 67r. When motion of the fiducials is within preferred tolerances, the green section 67g of the traffic light is on. For motion which is outside the normal range, but which is still acceptable, the yellow section 67y is on. The traffic light turns red when the motion of any of the fiducials is approaching the unacceptable. A scale 69 along the side of the display 53 indicates in bar graph form the percentage of maximum allowable displacement of the fiducial of maximum displacement. Thus, for instance, if the red light 67r is illuminated and the bar graph 71 indicates 80%, the fiducial with maximum displacement has moved by a distance which

5,727,554

5

is four fifths of the way through the acceptable displacement. The green, yellow and red regions need not be equal as shown in the example.

Detection of motion of a patient using passive fiducials requires an implementation which is robust enough to accommodate for the variations in the shapes, appearance and lighting conditions to which the fiducials are subjected and, at the same time, is fast enough to provide real time tracking of patient movement. The invention satisfies these requirements by utilization of successive levels of filtering and templates which are modified to accommodate for actual conditions. The result is a system which can track patient movement at 20 Hz or better.

Flow charts of suitable software 100 for implementing the invention are illustrated in FIGS. 6-16. FIG. 6 illustrates the main routine of the software 100 and includes detecting fiducials on the patient's body in the current camera image at 110. As will be described, this is accomplished utilizing templates. The templates are then fine tuned at 120 for the specific patient and environmental conditions. As long as the user desires monitoring as determined at 130, a loop is entered in which each individual fiducial is tracked as indicated at 140. It is possible that a fiducial can be lost by the tracking system. This could occur, for instance, if the patient moves so that a fiducial is blocked from the camera's view, or the patient moves a hand through the line of sight of the camera. Also, a fiducial may be temporarily lost by rapid movement or adverse lighting conditions. If a fiducial is lost, as determined at 150, a number of attempts can be made to reacquire it. If the fiducial is not reacquired within a reasonable time, however, it is removed from tracking as indicated by 160 and 170. If the selected number of attempts to reacquire, such as for example, five, have not been reached, an attempt is made to reacquire the fiducial at 180. If the fiducial is reacquired at 190, then a routine is run at 200 to generate any alarm if needed, and gating signals for the accelerator or beam generator 63 as indicated at 200. As long as any fiducials remain to be tracked as indicated at 210, the tracking loop is repetitively run.

FIG. 7 illustrates the general routine 110 for detecting the fiducials 39 in the image represented by the digital image signals. As mentioned, templates are used to identify the locations of the fiducials. The templates indicate what the pattern of digital signals representing the fiducial should look like. The size of the templates used must be considered. Larger templates improve the accuracy but take longer to process. In the exemplary system, templates 40 pixels square have been utilized. There are several ways in which the templates can be generated. As indicated at 111 in FIG. 7, idealized image templates can be utilized. In addition to such idealized templates or in place thereof, pre-stored image templates for the patient can be used as indicated at 112. Such pre-stored templates are used, for instance, for natural fiducials such as scars. One template is used for each family of fiducials. For instance, if all of the fiducials are the preferred fiducials such as shown in FIG. 3, only one template is required because all of the fiducials in the family will generate a similar image.

In addition, templates can be selected interactively by the user at 113. This is accomplished by using the mouse or trackball 59 to click on the center of a representation of the fiducial on the display 53.

Where the idealized or pre-stored templates are utilized, a multiresolution pyramid is used to locate the fiducials in the image using the templates. Thus, as indicated at 114, a search is made of the current image in low resolution for

6

candidate matches of all template families. In the exemplary embodiment of the invention, one-third resolution is used at this point. Matches are made using a normalized correlation between the template and the image. The matches found in low resolution are then verified and localized in high resolution at 115. The K best matches are then selected as the most reliable fiducials at 116 where K equals the number of fiducials to be tracked. The user is then given the opportunity at 117 to edit the detected location of fiducials found either through use of the idealized or pre-stored templates or templates generated interactively.

The details of the low resolution detection routine performed in block 114 of FIG. 7 is shown in FIG. 8. As shown at 114.1, the image can be raster scanned selecting points using sparse sampling. In raster scanning pixels are considered successively along each line, line-by-line in increments of one, while in sparse sampling the increment is greater than one. Alternatively, the image can be raster scanned as indicated at 114.2, selecting candidate points using interest operators followed by thresholding. Interest operators are simple patterns which emphasize gray scale characteristics of a particular fiducial. An example is shown in FIG. 17, where the fiducial is a light circle 73 on a dark background 75. The interest operator 77 could be, for instance, the one pixel value 79 in the center having a gray scale value matching that of the light circle 73, and the four pixels 81 at the cardinal points having gray scale values similar to that of the background 75. Such interest operators permit rapid searching of the image and should be selected as to assure identifying all of the fiducials in the family. They will most likely also generate additional candidate points. Returning to FIG. 8, the interest operator generated value in the exemplary system is the relative albedo. The relative albedo of each point in the low resolution scan is compared to a threshold value to select candidate points.

For each candidate point, a template matching is performed at 114.3, using a normalized correlation. Unwanted point matches are then filtered out at 114.4 using thresholding on the normalized correlation value. In the exemplary embodiment, a normalized correlation of 0.75 was used as the threshold. Bracketing and interpolation are then used at 114.5 to localize the remaining point/matches. In implementing bracketing, a rectangular image window is selected within which the desired point match will definitely lie. Then by interpolating between the correlation values of points on the border of the selected window along with its center, a new estimate of the location of the point match is calculated. This process is repeated with successively smaller windows centered on the new estimate of the location of the point match until a singular point is reached. In the exemplary system, the interpolation is performed using a two-dimensional Gaussian distribution.

FIG. 9 illustrates the techniques for verifying the candidate matches in high-resolution indicated at 115 in FIG. 7. Bracketing is performed on the selected matches in high resolution as indicated at 115.1. These points are then filtered at 115.2 within the same image neighborhood using minima suppression. In implementing minima suppression, for each point which has been a match, an area the size of the template is centered on the point. A point is selected as a further candidate match only if it is the best correlation with the template within the template window.

An important aspect of the invention is the fine tuning of the tracking templates called for at 120 in FIG. 6. FIG. 10 illustrates the details of fine tuning the templates. As indicated at 121, the median point/match from fiducials detected using the same initial template is selected. For example, if

5,727,554

7

there are three point matches for a fiducial family, the match having the middle value of correlation is selected. Notice that the match with the best correlation is not selected as it is likely to eliminate some valid matches. This technique adapts the selection of the template to be used for tracking to the actual conditions existing at the time of the selection. The relevant image portion is then acquired as the new template at 122, and the position, the interest operator value and the normalized correlation for all relevant point/matches using this newly acquired template is then recorded at 123. The steps 121-123 are accomplished for each template family. Then, the current special pattern of all the fiducials determined by the point/matches, is recorded at 124.

The program then enters the tracking loop at block 130 in FIG. 6. The routine for continuous tracking, which is called at 140 in FIG. 6 is illustrated in FIG. 11. The new position of the fiducial is estimated at 131 by projecting a velocity vector calculated from prior positions of the fiducial. Localization of fiducial position is then implemented in low resolution using bracketing and interpolation as indicated at 132. This is followed by high resolution localization of the fiducial position at 133, also using bracketing and interpolation.

The low resolution localization of block 131 is implemented by the routine illustrated in FIG. 12. As indicated at 132.1 points are selected by raster scanning the image window using sparse sampling. If interest operators are used, the interest operators with the value closest to that of the fiducial in the previous tracking step is selected at 132.2. In either case, a best match is selected using normalized correlation template matching at 132.3. This is followed by bracketing on the position of the best match at 132.4.

FIG. 13 illustrates the high resolution localization of fiducials called for in block 133 of FIG. 11. As indicated, bracketing is performed on a candidate with best match in high resolution as indicated at 133.1. If a match is found, the normalized correlation, interest operator value and position of the best match are calculated at 133.2. If desired, the sub-pixel accuracy of the position can be calculated at 133.3. The same interpolation technique as in bracketing and interpolation, as described above, is used. Alternatively, bilinear interpolation between the surrounding pixel correlation values could be used. Finally, if needed, charge coupled device (CCD) jitter is filtered out of the position at 133.4. In the exemplary system, a low pass filter is used.

The lost fiducial routine 150 in FIG. 6 is shown in FIG. 14. If the tracking routine finds no fiducial within the specified image window at 151, then clearly the fiducial has been lost. Even if a fiducial has been found, confirmation must be made that it is in fact the new position of the fiducial. Hence, a number of constancy tests are applied in 152. For instance, the normalized correlation value and the interest operator value must not change by more than a selected amount, such as, for example, 15%, from the most current values. Also, image limits are applied. For instance, the fiducial should not have changed position by more than a predetermined amount or, if the edge of the image is reached, the position indicated is not accepted as the fiducial may be out of the field of view, although a continued indication that it is at the edge may be presented.

The routine 180 in FIG. 6 for reacquiring the lost fiducial is shown in FIG. 15. First, the new position of the fiducial is estimated at 181 using a larger search window than was used at 141 in FIG. 11. The image window is then raster scanned in high resolution using sparse sampling to select the best match, if any, at 182. Bracketing is then performed

8

around the position of the best match, if any, at 183. The normalized correlation interest operator albedo and the position of the fiducial best matched is then determined at 184. This is followed by calculation of sub-pixel accuracy, if needed, at 185. Finally, the number of successive attempts to reacquire the fiducial is updated at 186.

FIG. 16 illustrates the routine 200 in FIG. 6 for generating the alarms and gating the accelerator or beam generator. The direction and distance traveled by each currently actively tracked fiducial since the detection step is estimated at 201. The special pattern of the actively tracked fiducials is compared with the initial pattern and previous patterns at 202. Any quasi-periodic motion associated with the individual fiducials and/or the special pattern is predicted at 203 such as by using past data analysis. This would include movement associated with breathing or tremor of the patient. The alarm warnings, alarm states and accelerator gating signals are then computed at 204 for display or for feedback to the equipment, such as the accelerator.

While specific embodiments of the invention have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of invention which is to be given the full breadth of the claims appended and any and all equivalents thereof.

What is claimed is:

1. Apparatus responsive to movement of a patient positioned on a patient positioning assembly during treatment/diagnosis, said apparatus comprising:

camera means generating digital image signals representing an image of at least one passive fiducial having a lambertian surface on said patient; and

processing means comprising means responsive to actual shape, appearance and lighting conditions of said at least one passive fiducial having a lambertian surface in said image represented by said digital image signals to determine successive positions of said at least one passive fiducial having a lambertian surface, means repetitively determining movement of said at least one passive fiducial having a lambertian surface from said successive positions, and means generating an output in response to predetermined values of said movement.

2. Apparatus responsive to movement of a patient positioned on a patient positioning assembly during treatment/diagnosis, said apparatus comprising:

a single camera generating digital image signals representing an image of at least one fiducial on said patient; and

processing means comprising means responsive to actual shape, appearance and lighting conditions of said at least one fiducial in said image represented by said digital image signals to determine successive positions of said at least one fiducial, means tracking three-dimensional movement of said at least one fiducial from said successive positions and means generating an output in response to predetermined values of said movement.

3. The apparatus of claim 2, wherein said means repetitively determining movement of said at least one fiducial includes means detecting movement associated with patient breathing, and said output means comprises means generating a gating signal synchronized to said patient breathing.

4. The apparatus of claim 2, wherein said processing means comprises means repetitively applying multiple lev-

5,727,554

9

cls of filtering to said digital image signals to determine successive positions of said at least one fiducial.

5. The apparatus of claim 4, wherein said means applying multiple levels of filtering includes means applying bracketing and interpolation to said digital image signals to determine position of said at least one fiducial.

6. The apparatus of claim 4, wherein said means applying multiple levels of filtering includes means applying minima suppression to said digital image signals.

7. The apparatus of claim 4, wherein said means applying multiple levels of filtering include means applying at least two types of filtering selected from a group consisting of correlation, sparse sampling, bracketing and interpolation, and minima suppression.

8. The apparatus of claim 7, wherein said processing means includes means using multiple levels of resolution of said digital image signals to determine successive positions of at least one fiducial and said means applying multiple levels of filtering comprise means applying filtering at each of said multiple levels of resolution.

9. The apparatus of claim 4, wherein said processing means includes means using at least one of templates and interest operators to determine successive positions of said at least one fiducial from said digital image signals.

10. The apparatus of claim 2, wherein said pressing means comprises means using a template to successively determine position of said at least one fiducial and means selecting said template.

11. The apparatus of claim 10, wherein said at least one fiducial comprises a plurality of fiducials, and said means selecting a template includes means generating an initial template, means generating template matches for each of said plurality of fiducials from said digital image signals using said initial template, and means selecting one of said template matches for use in determining positions of each of said plurality of fiducials.

12. The apparatus of claim 11, wherein said means selecting said one of said template matches includes means generating a value for each of said template matches, and means selecting a template match having a median value as said one template match.

13. Apparatus responsive to movement of a patient positioned on a patient positioning assembly during treatment/diagnosis, said apparatus comprising:

camera means generating digital image signals representing an image of at least one fiducial on said patient; and processing means comprising means responsive to actual shape, appearance and lighting conditions of said at least one fiducial in said image represented by said digital image signals to determine successive positions of said at least one fiducial at a rate of at least 20 Hz, means tracking movement of said at least one fiducial from said successive positions, and means generating an output in response to predetermined values of said movement.

14. The apparatus of claim 13, wherein said means generating an output includes means generating an indication of movement relative to at least one selected level of displacement.

15. The apparatus of claim 14, wherein said means generating said indication of movement includes means providing a warning that said movement exceeds a first displacement and means providing a signal for terminating

10

radiation treatment/diagnosis when said movement exceeds a second displacement greater than said first displacement.

16. The apparatus of claim 14, wherein said means generating an indication of movement comprises display means generating an image of said fiducials and an indication of said movement relative to said first and second displacements.

17. The apparatus of claim 16, wherein said camera means includes means generating digital image signals for a plurality of fiducials, said means repetitively determining movement determines movement of each of said plurality of fiducials, and said display means includes indicator means indicating a fiducial with the greatest movement.

18. The apparatus of claim 14, wherein said means repetitively determining movement includes means detecting movement associated with patient breathing and random movement, and wherein said means generating an indication of movement indicates said random movement.

19. Apparatus responsive to movement of a patient positioned on a patient positioning assembly during treatment/diagnosis, said apparatus comprising:

camera means generating digital image signals representing an image of at least one fiducial on said patient; and processing means comprising means responsive to actual shape, appearance and lighting conditions of said at least one fiducial in said image represented by said digital image signals to determine successive positions of said at least one fiducial, means repetitively determining movement of said at least one fiducial from said successive positions, and means generating an output in response to predetermined values of said movement; said processing means further comprising means using a template to successively determine position of said at least one fiducial and means selecting said template comprising display means, means generating on said display means an image of said at least one fiducial from said digital image signals and user interface means for selection of a template from said image of said at least one fiducial.

20. Apparatus responsive to movement of a patient positioned on a patient positioning assembly, said apparatus comprising:

camera means generating digital image signals representative of an image of said patient; and processing means comprising means determining movement of said patient from said digital image signals, including movement associated with breathing by said patient, and gating means generating gating signals synchronized with said movement associated with breathing by said patient.

21. The apparatus of claim 20, wherein said camera means generates said digital image signals representing an image of at least one fiducial on said patient, and said means determining movement of said patient includes means determining movement of said at least one fiducial.

22. The apparatus of claim 20 adapted for use during treatment of said patient with a radiation beam generated by a beam generator, wherein said gating means comprises means generating said gating signals synchronized to actuate said beam generator in synchronism with patient breathing.

* * * * *

EXHIBIT B



US005784431A

United States Patent [19]

Kalend et al.

[11] Patent Number: 5,784,431
[45] Date of Patent: Jul. 21, 1998

[54] APPARATUS FOR MATCHING X-RAY IMAGES WITH REFERENCE IMAGES

[75] Inventors: Andre M. Kalend, Monroeville; Joel Greenberger, Sewickley; Karen B. Shimoga, Pittsburgh, all of Pa.; Charalambos N. Athanasiou, Athens, Greece; Takeo Kanade, Pittsburgh, Pa.

[73] Assignee: University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

[21] Appl. No.: 739,622

[22] Filed: Oct. 29, 1996

[51] Int. CL⁶ A61N 5/10

[52] U.S. Cl. 378/65; 378/69; 378/901

[58] Field of Search 378/8, 20, 65, 378/68, 69, 901

[56] References Cited

U.S. PATENT DOCUMENTS

4,995,068 2/1991 Chou et al. 378/189
5,315,630 5/1994 Sturm et al. 378/65
5,398,684 3/1995 Hardy 128/653.1

OTHER PUBLICATIONS

IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. PAMI-7, No. 3, *Template Matching in Rotated Images*, A. Goshtasby, pp. 338-344, May 1985.
Image Registration by Local Approximation Methods, vol. 6, No. 4, A. Goshtasby, pp. 255-261, Nov. 1988.
Computer Vision, Graphics, and Image Processing 47, *Automated Registration of Dissimilar Images: Application to Medical Imagery*, M. Herbin et al., pp. 77-88, 1989.
Computer and Robot Vision, vol. I, 7.2.12 *Noise-Removal Techniques-Experiments*, R. Haralick and L. Shapiro, 1992.
International Journal of Computer Vision, 8:2, 99-111, *Feature Extraction from Faces Using Deformable Templates*, A. Yuille et al., pp. 99-111, 1992.

Pseudocorrelation: A fast, robust, absolute, grey-level image alignment algorithm, Medical Physics, vol. 21, No. 6, R. Radcliffe et al., pp. 761-769, Jun., 1994.

Technical paper of Xerox Palo Alto Research Center, Tracking and Recognizing Facial Expressions in Image Sequences, using Local Parameterized Models of Image Motion, M. Black and Y. Yacoob, Jan. 1995.

Clinical implementation of an objective computer-aided protocol for intervention in intra-treatment correction using electronic portal imaging, F. Van den Heuvel et al., Radiotherapy and Oncology 35 (1995) 232-239, Jun. 1995.

A Framework for the Robust Estimation of Optical Flow, Black, Michael J., Proc. Fourth Int. Conf. on Computer Vision (ICCV'93), Berlin, Germany May 1993.

Primary Examiner—David P. Porta

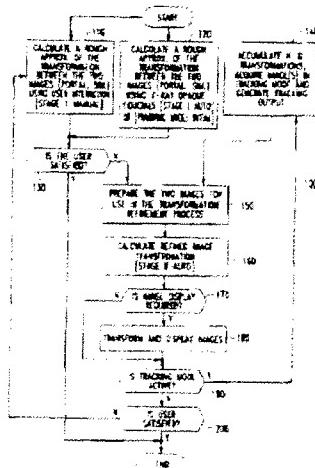
Assistant Examiner—David Vernon Bruce

Attorney, Agent, or Firm—Richard V. Westerhoff; Eckert Seamans Cherin & Mellot, LLC

[57] ABSTRACT

X-ray images such as radiotherapy portal images and simulation images are matched by apparatus which digitizes the images and automatically processes the digitized signals to generate matched digitized signals which can be displayed for comparison. The digitized images are first coarse aligned using a transform generated from seed points selected interactively from the two images or through detection and identification of x-ray opaque fiducials placed on the patient. A fine alignment is then performed by first selecting intersecting regions of the two images and enhancing those regions. Secondly, an updated transform is generated using robust motion flow in these regions at successive ascending levels of resolution. The updated transform is then used to align the images which are displayed for comparison. The updated transform can also be used to control the radiotherapy equipment.

28 Claims, 8 Drawing Sheets



U.S. Patent

Jul. 21, 1998

Sheet 1 of 8

5,784,431

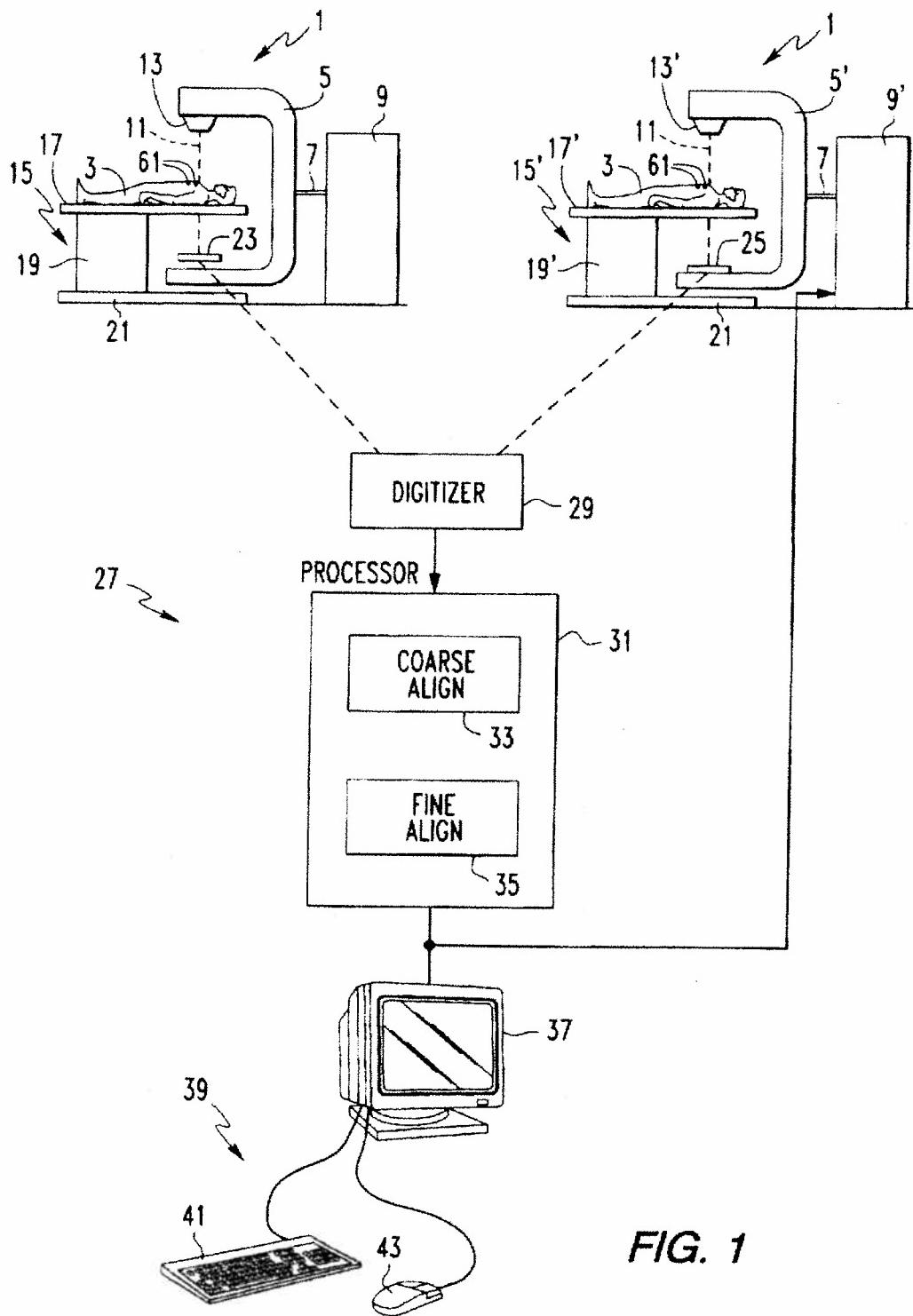


FIG. 1

U.S. Patent

Jul. 21, 1998

Sheet 2 of 8

5,784,431

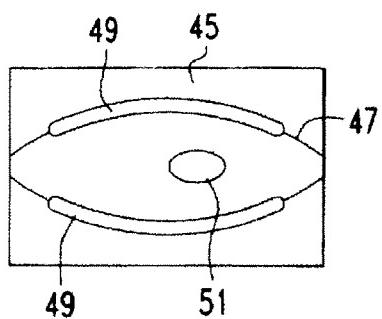


FIG. 2a

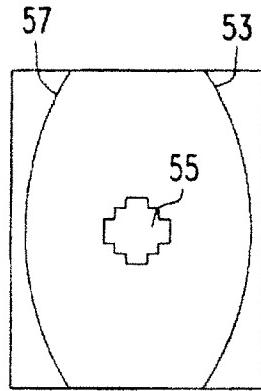


FIG. 2b

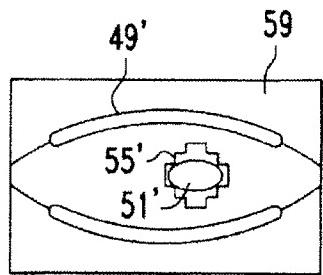


FIG. 2c

U.S. Patent

Jul. 21, 1998

Sheet 3 of 8

5,784,431

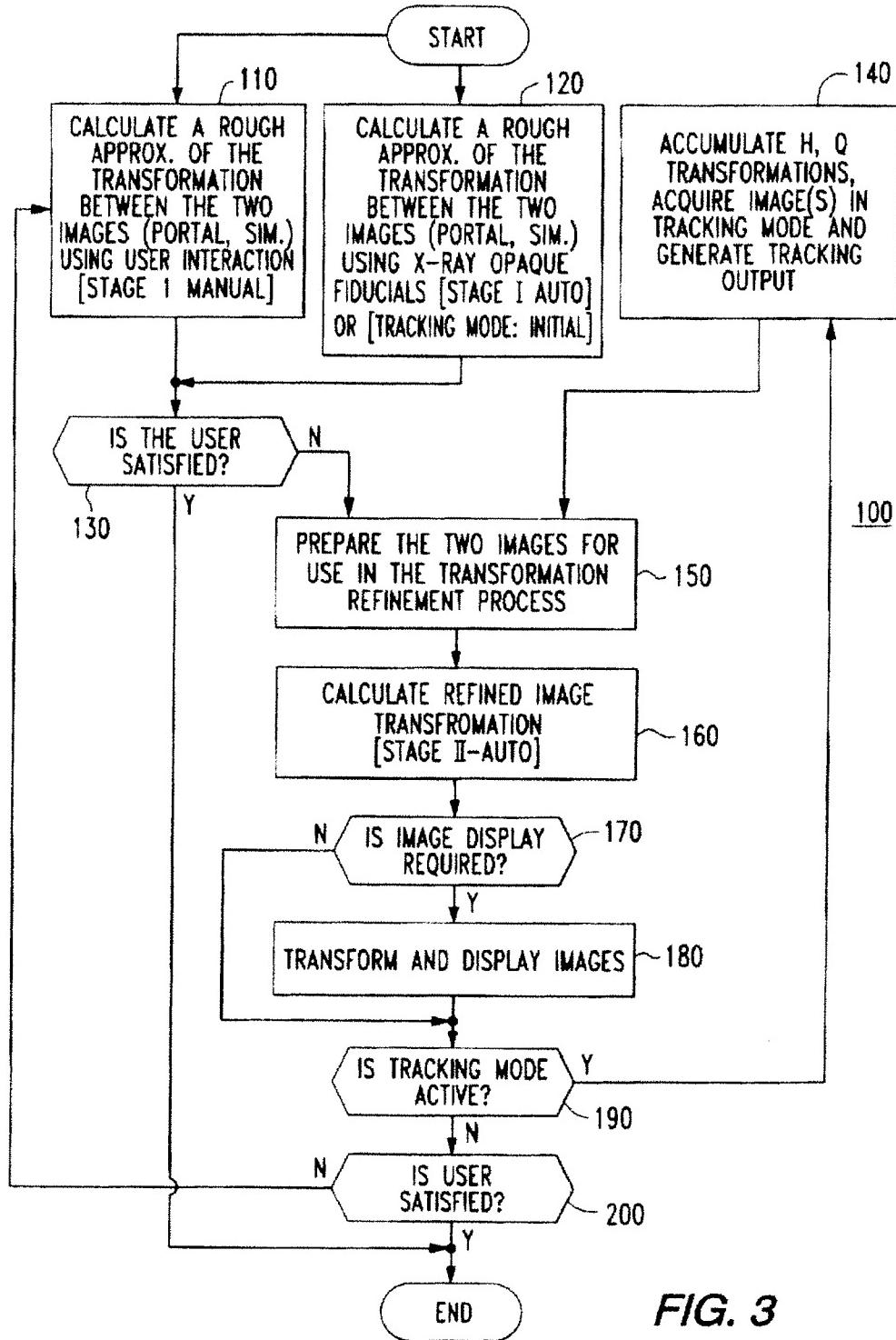


FIG. 3

U.S. Patent

Jul. 21, 1998

Sheet 4 of 8

5,784,431

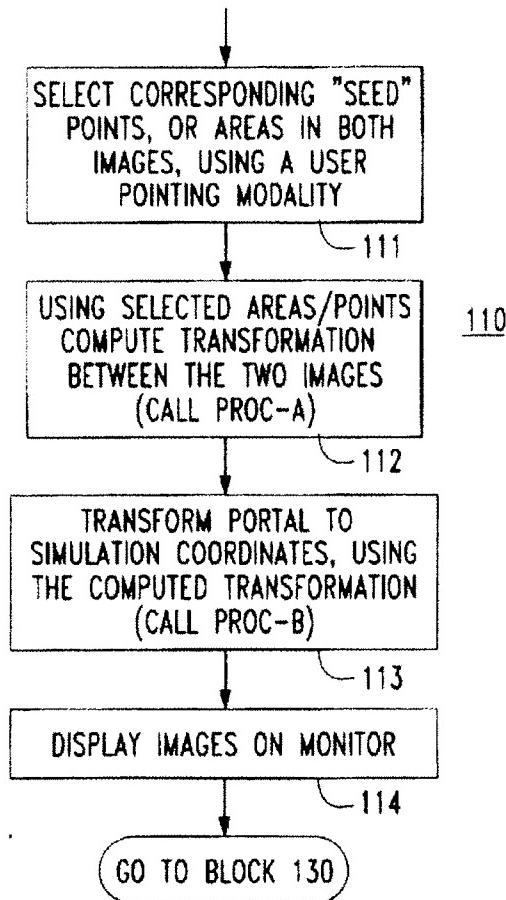


FIG. 4

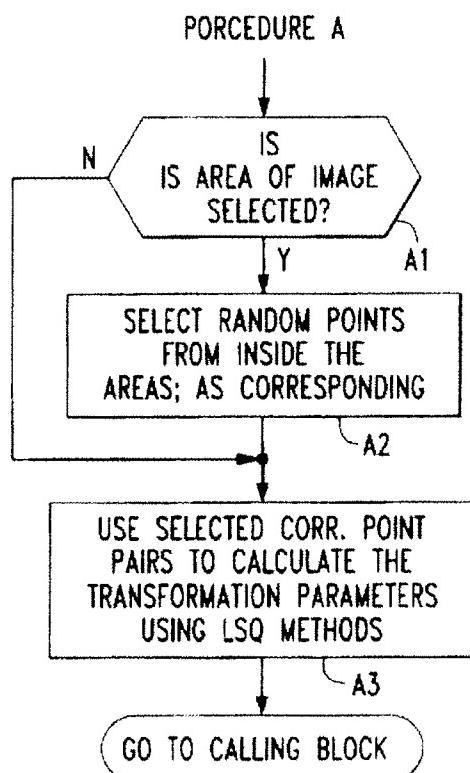


FIG. 5

U.S. Patent

Jul. 21, 1998

Sheet 5 of 8

5,784,431

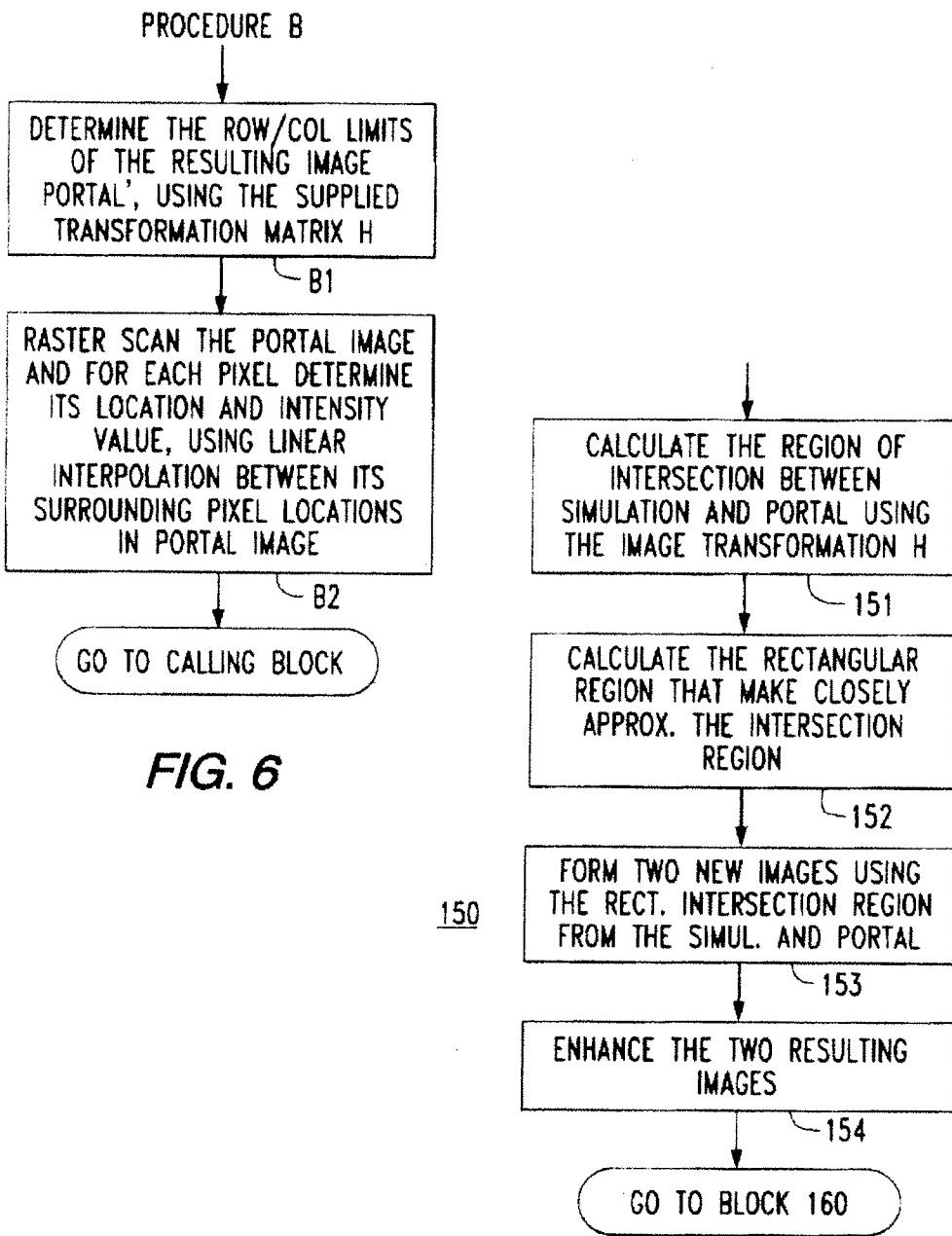


FIG. 6

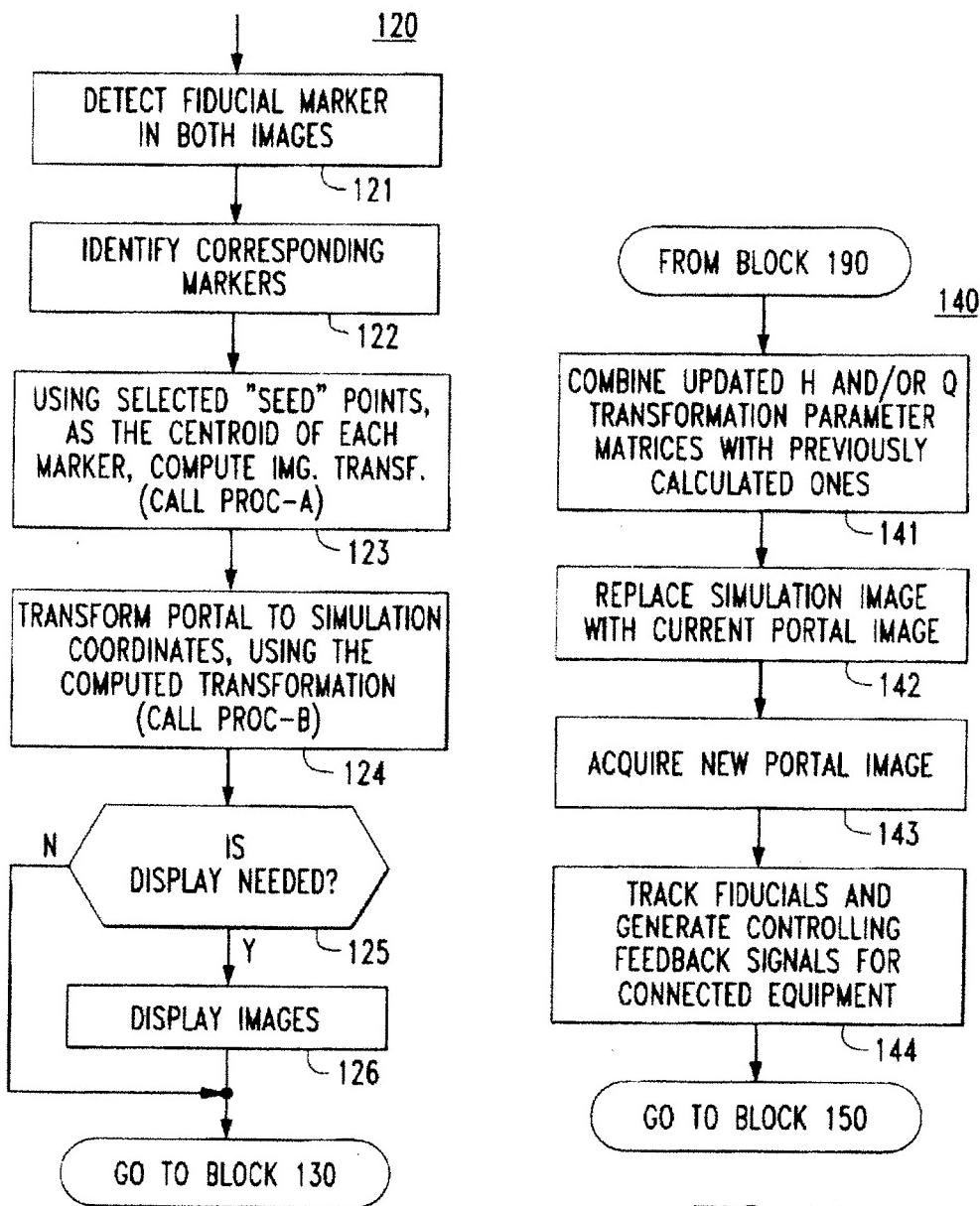
FIG. 8

U.S. Patent

Jul. 21, 1998

Sheet 6 of 8

5,784,431

*FIG. 11**FIG. 7*

U.S. Patent

Jul. 21, 1998

Sheet 7 of 8

5,784,431

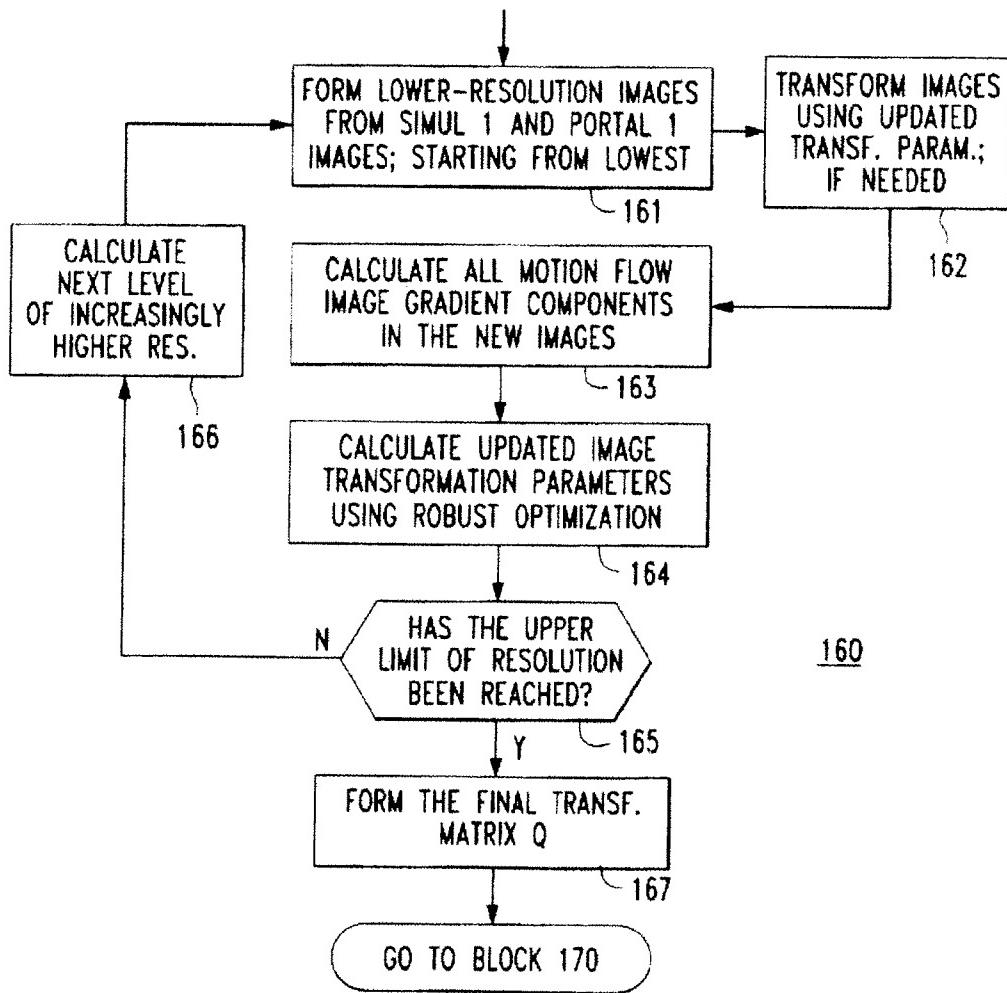


FIG. 9

U.S. Patent

Jul. 21, 1998

Sheet 8 of 8

5,784,431

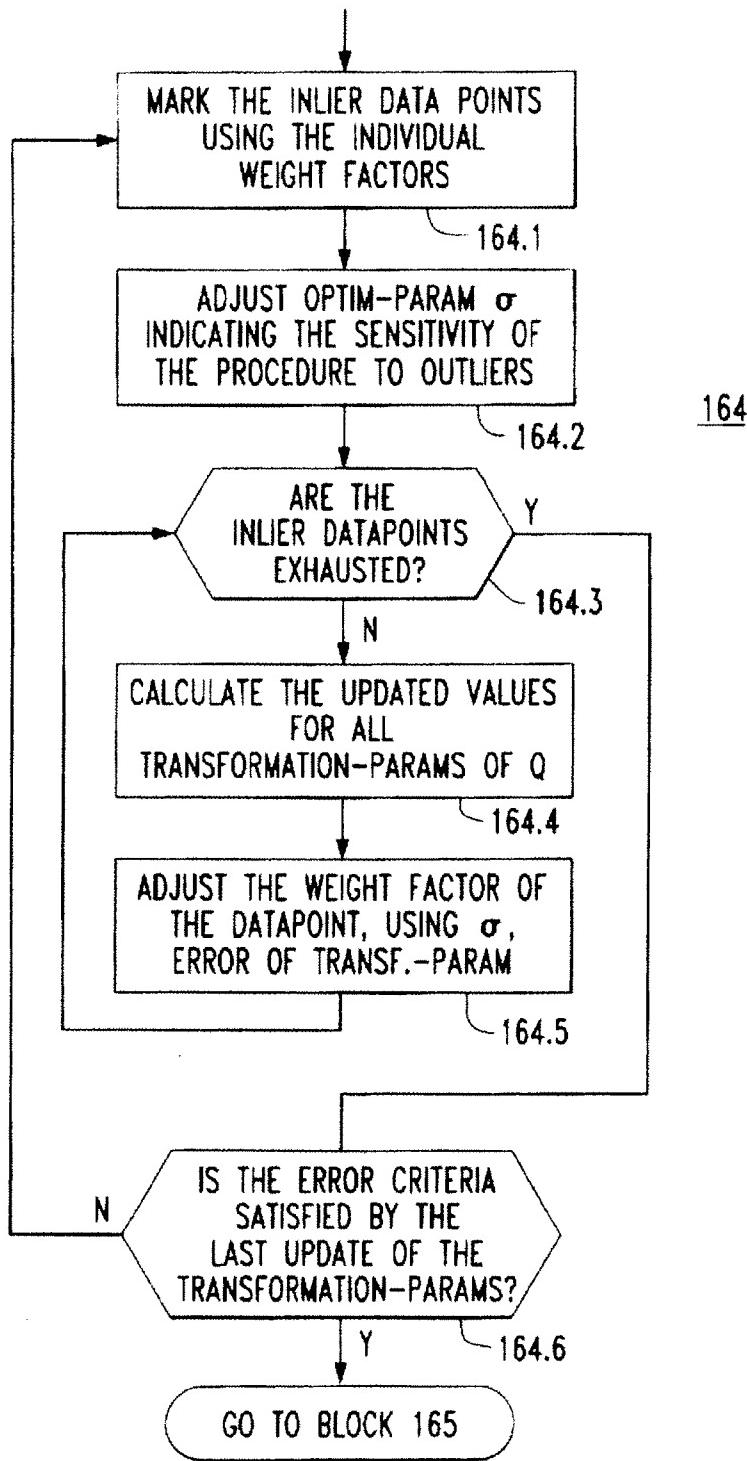


FIG. 10

5,784,431

1

APPARATUS FOR MATCHING X-RAY IMAGES WITH REFERENCE IMAGES**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to matching similar x-ray images and has particular application to computer controlled radiotherapy apparatus for automatically matching on-line the portal images generated during radiotherapy treatment on a treatment machine with simulation images generated prior to treatment on a simulation machine for determining that the desired target is actually being irradiated for the purposes of assessment, and/or controlling the treatment equipment.

2. Background Information

There are medical applications which require matching of x-ray images. For instance, in computer controlled radiotherapy, treatment beams of high energy radiation are directed at a tumor from a number of directions so as to maximize irradiation of the tumor while minimizing exposure of healthy tissue surrounding the tumor. Such radiotherapy treatment typically has two distinct phases: the simulation phase, and the actual treatment phase. In the simulation phase, the patient is placed on equipment similar to the treatment equipment except that it does not generate the high energy radiation beam. The simulation equipment is successively positioned to simulate the delivery of the sequence of treatment beams prescribed by the treating oncologist. This assures that the equipment can be positioned to deliver the required treatment beams and progressively move from one treatment beam to the next without collision between the equipment and the patient or between movable components of the equipment. During this procedure a low dosage x-ray image called the simulation image is taken. This simulation image, which generally has good contrast and detail because of the low energy of the x-ray beam used (in the kiloelectronvolt range) helps the oncologist to locate the position of the tumor and thereby establish the positions of the equipment components for delivering the successive treatment beams.

During the actual treatment phase, the patient is placed in the exact same position on the equipment as in the simulation before the regular-dosage x-ray radiation, typically in the megaelectronvolt range, is used to treat the patient. During this phase, another x-ray image is taken, which is called the portal image.

After completion of the treatment, the simulation and portal images are compared by an expert to determine whether the tumor, as identified in the simulation image, has been adequately treated with radiation in the portal image. If the coverage is not complete, the patient is scheduled for a corrective treatment.

The current accepted procedure involves the manual comparison of the portal and simulation images. Accurate manual comparison is quite challenging given the fact that the two x-rays are usually taken by different equipment and at different levels of radiation exposure. The latter fact implies that the tumor area is usually not visible in the portal x-ray, and thus the matching of the portal image with that of the simulation has to rely on manual estimation of dimensions from anatomical landmarks, which will not be clearly visible.

Conventionally, the portal images have been generated by using x-ray film which has to be developed. This is not a serious drawback where only a single or a few treatment beams are utilized. However, this x-ray film is a serious

2

limitation in computer controlled radiotherapy where a large number of treatment beams are used. Electronic portal imagers have been developed which generate a digitized image which can be displayed on an electronic display device. Unfortunately, the same problems exist as to the contrast and definition in the portal image generated electronically.

The problem of matching portal images with simulation images is compounded by the fact that the images have differences in orientation caused by skewing, scaling differences, rotation, translation and differences in perspective and curvature.

In stereotactic radiology, digitized computed tomography x-ray images and magnetic resonance images (MRI) have been automatically matched by applying scaling derived from known fixed dimensions of a steel frame which appears in both images. Such fixed landmarks of known dimensions are not available in conventional radiotherapy images.

There is a need, therefore, for apparatus for automatically matching x-ray images and particularly for matching portal images with simulation images in radiotherapy.

There is also a need for such apparatus which can match the portal and simulation images on-line for multiple treatment beams.

There is further need for such apparatus which can match portal images and simulation images having widely different contrast and definition and differences caused by skewing, rotation, scaling, perspective or curvature.

There is an additional need for apparatus for obtaining and maintaining alignment of a patient during computed controlled radiotherapy or for terminating the radiation beam if alignment becomes unacceptable.

SUMMARY OF THE INVENTION

These needs and others are satisfied by the invention which is directed to apparatus for automatically matching an x-ray image with a reference image, and particularly for matching the portal image with a simulation image for determining whether radiotherapy treatment has been adequate or for matching successive portal images for controlling operation of the radiotherapy equipment. In matching images, digitizing means digitizes the x-ray image such as the portal image to generate a first set of digital image signals or digital portal image signals (DPIS) in the case of the portal image. The digitizing means also digitizes the reference image such as the simulation image to generate second digital image signals or digital simulation signals (DSIS). Processing means process these digital image signals to generate matched digital image signals. The processing is performed without any prior knowledge of the physical dimensions of any of the features in the images. Output means generate for instance a display from the matched digital image signals and/or control the treatment/diagnosis equipment.

The processing means includes coarse alignment means which first effect a coarse alignment between the digital portal image signals and the digital simulation image signals. Coarse alignment is initiated by selecting seed points in the portal image represented by the DPIS and in the simulation image represented by the DSIS. Selection of the seed points can be done either interactively using a pointing device such as a mouse to select what appear to be corresponding points on displays of the two images, or automatically through use of x-ray opaque fiducials placed on the patient. In either case, the seed points are used to compute a transform between the two images. Means are then used to

5,784,431

3

apply the transform to one of the sets of digital image signals to transform points in that image to the coordinates of the other image thereby producing coarse aligned DPIS and DSIS.

Following coarse alignment, a fine alignment is performed. In implementing the fine alignment, the coarse aligned DPIS and DSIS are first prepared by selecting selected DPIS and selected DSIS for regions of the images which intersect or overlap, and preferably for a region of regular shape such as a rectangle within the intersecting regions of the images. The digital image signals for these regions are then enhanced to produce prepared images with similar dynamic range and pixel intensities. The fine alignment means includes means generating an updated transform from the prepared DPIS and DSIS, and means applying the updated transform to either the coarse or prepared DPIS and DSIS to generate the matched DPIS and DSIS.

The means generating the updated transform comprises means generating motion flow components from the prepared DPIS and DSIS and calculating means calculating the updated transform from the motion flow components. Preferably the means generating the motion flow components generates motion flow gradient components and the calculating means comprises means applying a robust optimization to calculate the updated transform. The means generating updated transform uses successive ascending levels of resolution of the prepared DPIS and DSIS to generate the updated transform.

In the tracking mode, the updated transform is used to track movement between successive sets of digital portal image signals. Tracking can be used to terminate the radiation if patient movement exceeds specified limits, or could be used to operate the patient positioning assembly to maintain the radiation beam in proper alignment with the area to be treated.

The invention can also be used to match x-ray images with other reference images which could be another x-ray image or another type of image.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following description of the preferred embodiments when read in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic diagram of apparatus for implementing the invention.

FIG. 2a is a simplified illustration of a simulation image to which the invention can be applied.

FIG. 2b is a simplified illustration of a portal image to which the invention may be applied.

FIG. 2c is a simplified illustration of a display superimposing the simulation and portal images of FIGS. 2a and 2b utilizing the invention.

FIGS. 3-11 are flow charts of software utilized to implement the invention in the apparatus of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is directed to matching x-ray images with reference images and will be described as applied to matching portal images generated in computer controlled radiotherapy with simulation images. However, it will be understood that the invention has wide application in matching other x-ray images such as those used in diagnosis, for example. As will be seen, the invention also has application

4

for tracking motion in successive portal images such as for controlling positioning of a patient or gating of the radiation beam.

Referring to FIG. 1, a simulation setup 1 is used for determining the location of the region such as a tumor within a patient 3 to be treated and for setting up the sequence of treatment beams. The setup equipment includes a gantry 5 mounted for rotation about a horizontal pivot 7 supported by a machine base 9. A low energy, in the kiloelectronvolt range, x-ray beam 11 is directed by a collimator 13 mounted on the gantry 5 along a path which extends transversely through an extension of the pivot 7.

The patient 3 is supported on a patient positioning assembly 15 which includes a couch 17 mounted on a support 19 for three dimensional translation relative to the support. The support 19, in turn, is mounted on a turntable 21. Through translation of the couch 17, rotation of the turntable 21 and rotation of the gantry 5 about the pivot 7, a plurality of treatment beams can be simulated. By sequencing the simulation equipment 1 through the positions required to generate the successive beams, it can be determined whether all of the required beams can be achieved and whether sequencing the movement of the equipment between beams must be adjusted to avoid collisions between the equipment and the patient or between components of the equipment.

The low energy x-ray beam 11 is used to generate simulation images by placement of an x-ray film 23 in line with the x-ray beam 11 on the other side of the patient 3 from the collimator 13. This simulation image is used to position the area of the patient to be treated, such as a tumor, at the isocenter of the setup, which is the intersection of the beam 11 with a projection of the pivot axis 7.

Following completion of the simulation, the patient 3 is transferred to the treatment setup 1'. As shown, the treatment setup at 1' is similar to the simulation setup 1, except that the x-ray beam 11' is in the megaelectronvolt range. A portal image is generated by the treatment setup 1'. This portal image can be captured by an x-ray film as in the simulation setup; however, it is preferred that an electronic portal imager 25 be used. If available, an electronic imager could also be used in place of the x-ray film 23 in the simulation setup 1.

As discussed above, the simulation image and the portal image can be quite different. One of the main reasons for this is the difference in the energy of the beams 11 and 11'. The invention can be used to match the simulation and portal images to determine if the treatment dosage was delivered to the proper treatment area. It can also be used to detect patient movement during treatment to terminate generation of the x-ray beam 11' if a movement exceeds proper limits, or to maneuver the equipment to maintain proper alignment.

The image matching system 27 includes a digitizer 29 which digitizes the simulation image such as produced on the x-ray film 23 and the portal image such as that generated by the electronic portal imager 25. In a more general sense, the matching system 27 matches an x-ray image, such as the portal image, with a reference image such as the simulation image.

The image matching system 27 further includes a processor 31 which includes a module for coarse alignment 33 followed by a module for fine alignment 35. The output of the processor can be matched portal (x-ray) and simulation (reference) images which are displayed on a display device 37. Associated with the display device 37 are interface devices 39 which can include a keyboard 41 and a pointing device 43, such as a mouse or a trackball.

5.784,431

5

FIGS. 2a-2c illustrate that the invention can be used to match a portal x-ray image with a simulation reference image. FIG. 2a represents a simulation image 45 generated using the simulation setup 1. The low energy x-rays used for this image produce an image with good contrast and detail, so that the outline 47 of the patient and bony structure 49 are shown as well as the tumor 51. FIG. 2b illustrates the portal image which being taken with the higher energy treatment beam shows the treated area 55 as a uniform dark spot. The irregular edge of the treated area 55 is produced by the leaves used in the collimator 13 to conform the beam 11 generally to the shape of the tumor. The remainder of the portal image 55 shows little detail and does not indicate the location of the bones. As can be seen, the two images 45 and 53 can be translated relative to each other, scaled differently, skewed and rotated (by 90° in the example). The two images can also be different in perspective and in curvature.

The coarse alignment module 33 produces a general alignment of the two images, and then the fine alignment module 35 uses robust motion flow to rapidly and accurately complete matching of the images. The display device 37 can present the matched images in different ways. In one embodiment, the display 37 alternates between the two images at about 6 to 20 Hz, but usually about 12 Hz, so that the observer views the images superimposed as a composite image 59, as shown in FIG. 2c. As can be seen in the example, the treated area 55 in the matched portal image, overlays the tumor 51 in the matched simulation image. In another type of display (not shown), the outline of the treated area from the portal image is projected onto the processed simulation image, so that it can be seen if the targeted tumor was in fact treated.

In performing the coarse alignment, a coarse transformation is applied to the digitized x-ray or portal image signals (DPIS) to convert them to the coordinate system of the digital reference or simulation image signals (DSIS). As will be seen, the information needed to generate this transformation can be generated interactively through selection of what appear to be corresponding points in the two images by the operator interactively using a pointer device 43 or automatically using x-ray opaque fiducials 61 which are placed on the patient in both the simulation setup and the treatment setup (see FIG. 1). The points so generated in either case are referred to as seed points. The coarse transform H from the portal image coordinates to the simulation coordinates is:

$$\begin{bmatrix} \text{simulation}_x \\ \text{simulation}_y \\ 1 \end{bmatrix} = \begin{bmatrix} \text{RotSkewScale}_x, \text{RotSkewScale}_y, \text{translation}_x \\ \text{RotSkewScale}_x, \text{RotSkewScale}_y, \text{translation}_y \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} \text{portal}_x \\ \text{portal}_y \\ 1 \end{bmatrix} \quad (\text{EQ. 1})$$

The (x y) vector denotes the column and row coordinates of the center of each of the seed points in the corresponding portal and simulation images. The four RotSkewScale components of the matrix describe the full affine transformation that is needed to coarsely align the images. In this stage, the placement of the fiducial or the interactive selection of the seed points need not be accurate as the next stage is able to accommodate for reasonably small deviations.

Using the results of the coarse alignment, the portal image is warped toward the simulation image. Then, overlapping regions of the two images are computer enhanced so that the

6

corresponding intensity levels are similar. Finally, the motion-flow, or the fine-scale transform is computed so that the portal image glides on the gradient of dissimilarity toward the simulation image. In this stage, a more comprehensive transformation model is used in which the input position vector is represented by:

$$\underline{x}(x) = \begin{bmatrix} 1 & x & y & 0 & 0 & 0 & x^2 & x \cdot y & 0 \\ 0 & 0 & 0 & 1 & x & y & x \cdot y & y^2 & x^2 \end{bmatrix} \quad (\text{EQ. 2})$$

and the transformation matrix is represented by:

$$Q = [\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, P_0, P_1, c]^T \quad (\text{EQ. 3})$$

so that the result is:

$$u(x; Q) = X(x) \cdot Q \quad (\text{EQ. 4})$$

where Δ portal ($x; Q$) = $u(x; Q)$ and portal (x) = $X(x)$. The parameters α_0 through α_5 include the affine transform as in the coarse alignment, whereas the parameters P_0, P_1 include the perspective transformation, and c covers the deformation that can be caused by breathing, etc.

To recover the parameters of the vector Q we formulate the image dissimilarity as a result of motion-flow, or distance between the two images.

$$I(x, t) = I(x - (X(x) \cdot Q_{f, n, t})) \quad (\text{EQ. 5})$$

for $\forall x \in f$, where f is the region of the image we compute the transformation over. In (EQ. 5), $I(x)$ is the intensity function at point x , the image at $t+1$ is the portal image, and at t is the simulation image. By using various derivation techniques, we formulate the motion-flow using the gradient (or dissimilarity gradient) as below:

$$\nabla I(X(x) \cdot Q_t) + \frac{\partial I}{\partial t} = 0 \quad (\text{EQ. 6})$$

for $\forall x \in f$.

In this stage, a robust regression method is employed, using unconstrained optimization, to calculate the elements of Q (see (EQ. 3)). This technique enables us to cope with the 'reasonably small' deviations from the coarse alignment stage, as well as any residual dissimilarity between the two images. Using the robust technique ensures that only the dominant transformation will be recovered without running into the risk of being affected by the noise and residual errors.

FIGS. 3-11 are flow charts of software which implements the invention. FIG. 3 illustrates the main routine 100 which includes performing a coarse alignment, either interactively at block 110 or automatically at block 120. In both cases a rough approximation of the transformation between the portal image and the simulation image is calculated using Equation 1. The user then has the option of determining whether the rough approximation has provided a satisfactory alignment of the images at 130. If so, the procedure is completed. If not, a fine alignment is performed. As discussed, the invention can also be used to track patient movement, in which case the transformation between the two images is utilized at 140 to roughly determine the updated position of the fiducials. If requested by the user in image matching and during tracking, the images are prepared for the fine alignment at 150. The refined image transformation is then calculated at 160 and if the image

5,784,431

7

matching mode is selected as determined at 170, the transform is accomplished and the images are displayed at 180 in the manner discussed above. If the tracking mode has been selected at 190, the routine returns to 140 for generating the next position. The user again has the final decision at 200 to determine whether the image matching is satisfactory. If not, the routine returns to 110 and the rough calculation is re-initiated.

The procedure for calculating the rough approximation of the transformation interactively called for at block 110 in FIG. 3 is illustrated in detail in FIG. 4. The user selects corresponding seed points or areas in the portal image and the simulation image using, for instance, the mouse 43 as indicated at 111. The selected areas or points are then used to compute the rough transformation between the portal image and the simulation image by calling a procedure A as indicated at 112. This rough transform is then used to transform the portal image to simulation image coordinates by calling procedure B as indicated at 113. The images are then displayed on the monitor 37 as indicated at 114.

The details of procedure A used to calculate the rough transform are shown in FIG. 5. If the user has indicated an area as determined at A1, the system automatically selects random points from inside the area as corresponding as indicated at A2. Then, or if the user has selected points rather than an area, the corresponding point pairs are used to calculate the transform parameters using the least squares (LSQ) method as indicated at A3.

The details of procedure B for transforming the portal to simulation coordinates is shown in FIG. 5. First, the row and column limits of the resulting transformed portal image are determined at B1 using the transformation matrix H, which is the inverse of Equation 1. The resulting portal image is then raster scanned at B2, and for each pixel the location is determined using the transformation. The intensity value for each pixel is calculated next using linear interpolation between the surrounding pixel locations in the original portal image.

The routine 124 for performing the coarse alignment automatically using fiducials on the patient is shown in FIG. 7. The x-ray opaque fiducials 61 are detected in both the portal and simulation images at 121 and the corresponding markers are identified at 122. The image transform is then computed at 123 using procedure A of FIG. 5 and the centroid of each of the markers as the seed points. The portal image is then transformed to simulation coordinates using the computed transformation and procedure B of FIG. 6. When in the matching mode as determined at 125, the images are displayed at 126 in the manner discussed above in connection with FIGS. 2a-c.

The routine 150 for preparing the coarse aligned digital image signals for fine alignment is shown in FIG. 8. First, the region of intersection over overlap between the simulation and portal images is calculated at 151 using the transformation of Equation 1. Next, the largest rectangular region that fits within the intersection region is calculated at 152. Other regular geometric shapes, such as a square and so forth, could be used in place of the rectangle. New images representing the rectangular intersection region of the portal and simulation image are formed at 153. These resulting images are then enhanced at 154 to generate prepared digital image signals. Various forms of enhancement such as histogram equalization, laplacian of the Gaussian, high-pass filtering and other techniques are used to produce the prepared images with similar dynamic range and pixel intensities.

FIG. 9 illustrates the routine 160 for calculating the updated transformation for a fine alignment. This process is

8

performed at several levels of resolution of the digital image signals beginning with the lowest resolution, which in the example is about one-eighth resolution. Thus, at 161 the images at the lowest resolution for the prepared portal and simulation images are formed. These images are updated using the latest updated transformation parameters, that is, transformation parameters calculated at the previous level of resolution, at 162. An important part of the invention is that robust motion flow is used to perform the fine alignment. In particular, the motion flow gradient components are generated at 163. Application of motion flow using gradient components is described by M. J. Black and P. Anandan in a paper entitled, "A Framework For The Robust Estimation Of Optical Flow" published in Proc. 4th Int'l. Conf. on Computer Vision (ICCV 93), Berlin, Germany, May 1993. Motion flow is applied to the motion required to cause pixels on one image to flow into alignment with corresponding pixels in the other image. Robust motion applies to the motion by which most of the pixels which have moved have moved similarly, while there may be others exhibiting different motion. The updated image transformation parameters are then calculated at 164 using robust optimization. If the upper limit of resolution has not been reached as determined at 165, then the resolution is incremented at 166 and updated transformation parameters are recalculated at the new level of resolution.

When the highest level of resolution has been reached at 165, the final transformation matrix Q is generated at 167. The details of the routine for calculating the updated image transformation parameters using robust optimization of block 164 in FIG. 9 is shown in FIG. 10. As described in the paper by Black and Anandan discussed above, the robust motion is represented by data points called inliers. Those exhibiting other motion are identified as outliers. In the present invention, the data points are the pixel values. The pixels are successively separated into inliers and outliers based upon their contribution to a consistent motion flow vector. The pixels in the inlier set are used to calculate the dominant motion flow, and their contribution to it is dependent on their weight factors which are calculated during the robust optimization.

Referring particularly to FIG. 10, a loop is entered at 164.1 where each of the inlier points is marked using individual weight factors. Initially, the weight factors of the pixels are all set to 1 so that all of the pixels are inliers. At 164.2, an optimization parameter, σ , which determines the sensitivity of the procedure to outliers is set. The weight factors are dependent on this parameter, σ . The lower the value of σ , the more points are eliminated as outliers and the closer the inliers become to the current estimate of the motion flow vector. Hence, a large σ is used initially so that all points are included. On successive loops, σ is lowered to eliminate more and more outliers. This lowering of σ is referred to as σ scheduling. The σ scheduling must be done carefully. If σ is lowered too fast, a solution may be missed, while on the other hand, lowering σ too slowly increases the processing time. In accordance with the invention, σ is lowered depending upon the largest error in the motion flow parameters. Following this, another loop is entered at 164.3 in which each of the inlier data points is used in the calculation of the updated values for the transformation parameters of the Q matrix at 164.4. The equations used at 164.4 are derived preferably using the conjugate gradient, although gradient descent can also be used. In addition, motion flow and robust statistics are used in deriving equations for determining the transformation parameters. The error in the transformation parameters, which is the change

5.784,431

9

from the last calculation, as well as σ , are used at 164.5 to adjust the weight factors for the pixels. When all of the inlier data points/pixels have been used as determined at 164.3, a check is made at 164.6 to determine if the solution has converged to the desired degree. If not, the routine returns to 164.1 and the inlier data points are again marked using the updated weight factors.

FIG. 11 illustrates the tracking routine on 140. As indicated at 141, the incremental updates and the transform H and/or Q are combined so that the transform always relates back to the original simulation or reference image. On the initial pass through the tracking routine, the then current portal image replaces the simulation image if used, and then a new portal image is acquired at 143. As tracking continues, successive portal images are matched with the next preceding portal image to generate the updated transform. As indicated at 144, the successive positions of the fiducials or changes in the pattern of the fiducials from successive portal images is used to generate tracking signals for controlling the radiotherapy equipment such as turning the beam on and off and/or driving the patient positioning assembly.

While specific embodiments of the invention have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of invention which is to be given the full breadth of the claims appended and any and all equivalents thereof.

What is claimed is:

1. Apparatus for automatically matching a portal image with a simulation image, said apparatus comprising:

means digitizing said portal image and simulation image to generate digital portal image signals (DPIS) and digital simulation image signals (DSIS), respectively; processing means processing said DPIS and said DSIS to generate matched DPIS and DSIS; and output means for generating an output from said matched DPIS and DSIS.

2. The apparatus of claim 1, wherein said processing means comprises coarse alignment means generating coarse aligned DPIS and DSIS from said DPIS and DSIS, and fine alignment means generating said matched DPIS and DSIS from said coarse aligned DPIS and DSIS for overlapping regions of said simulation and portal images.

3. The apparatus of claim 2, wherein said coarse alignment means comprises means selecting corresponding seed points in said portal image represented by said DPIS and said simulation image represented by said DSIS, means computing a transform between said portal image and said simulation image from said corresponding seed points, and means applying said transform to one of said DPIS said DSIS to generate with the other of said DPIS and DSIS said coarse aligned DPIS and DSIS.

4. The apparatus of claim 3, wherein said means selecting corresponding seed points comprises interactive means selecting corresponding points in displays generated from said DPIS and DSIS.

5. The apparatus of claim 3, wherein said means selecting corresponding seed points comprises means detecting x-ray opaque fiducials in said DPIS and said DSIS, and means identifying corresponding fiducials in said DPIS and DSIS as said corresponding seed points.

6. The apparatus of claim 3, wherein said fine alignment means comprises means generating prepared DPIS and DSIS from said coarse aligned DPIS and DSIS, means

10

generating an updated transform from said prepared DPIS and DSIS, and means applying said updated transform to one of said coarse and prepared DPIS and DSIS to generate said matched DPIS and DSIS.

7. The apparatus of claim 2, wherein said fine alignment means comprises means generating prepared DPIS and DSIS from said coarse aligned DPIS and DSIS, means generating an updated transform from said prepared DPIS and DSIS, and means applying said updated transform to one of said coarse and prepared DPIS and DSIS to generate said matched DPIS and DSIS.

8. The apparatus of claim 7, wherein said means generating said prepared DPIS and DSIS comprises means selecting selected DPIS and selected DSIS for regions of images represented by said DPIS and DSIS which intersect.

9. The apparatus of claim 8, wherein said means generating said prepared DPIS and DSIS further includes means enhancing said selected DPIS and DSIS.

10. The apparatus of claim 9, wherein said means selecting said selected DPIS and selected DSIS further includes means selecting DPIS and DSIS within a portion of regions of images represented by said DPIS and DSIS, which have a predetermined regular shape.

11. The apparatus of claim 7, wherein said means generating said updated transform comprises means generating motion flow components from said prepared DPIS and DSIS and calculating means calculating said updated transform from said motion flow components.

12. The apparatus of claim 11, wherein said means generating motion flow components generates motion flow gradient components, and said calculating means comprises means applying a robust optimization to calculate said updated transform.

13. The apparatus of claim 12, wherein said means generating said updated transform comprises utilizing said means generating motion flow gradient components and said calculating means repetitively using successive ascending levels of resolution of said prepared DPIS and DSIS.

14. The apparatus of claim 7, wherein said means generating said updated transform comprises means using successive ascending levels of resolution of said prepared DPIS and DSIS to generate said updated transform.

15. The apparatus of claim 7, wherein said means generating said updated transform comprises means applying robust motion flow to said prepared DPIS and DSIS.

16. The apparatus of claim 15, wherein said means applying robust motion flow to said prepared DPIS and DSIS applies robust motion flow to successive ascending levels of resolution of said DPIS and DSIS.

17. The apparatus of claim 1, wherein said output means comprises display means generating a display from said matched DPIS and DSIS.

18. The apparatus of claim 1, wherein said output means comprises tracking means tracking movement in said image represented by said DPIS.

19. The apparatus of claim 18, wherein said output means further includes positioning means positioning a patient relative to a radiation beam which generates said portal image, and means controlling said positioning means in response to movement tracked by said tracking means.

20. The apparatus of claim 18, wherein said output means includes means controlling generation of a radiation beam producing said portal image in response to movement tracked by said tracking means.

21. Apparatus for matching portal images to control radiotherapy/diagnosis equipment, said apparatus comprising:

5.784,431

11

means digitizing successive portal images to generate successive sets of digital portal image signals (DPIS); and

tracking means tracking movement between successive sets of DPIS.

22. The apparatus of claim 21, wherein said tracking means comprises means generating an updated transform between successive portal images by applying robust motion flow to said successive sets of DPIS and means using said updated transform to track said movement between said successive sets of DPIS.

23. The apparatus of claim 22, wherein said means generating said updated transform comprises means generating motion flow components from said successive sets of DPIS, and means calculating said updated transform between successive portal images using said motion flow components.

24. The apparatus of claim 23, wherein said means generating motion flow components generates motion flow gradient components, and wherein said calculating means comprises means applying a robust optimization to calculate said updated transform.

25. The apparatus of claim 24, wherein said means generating said updated transform comprises means utilizing said means generating motion flow gradient components and said calculating means repetitively using successive ascending levels of resolution of said successive sets of DPIS.

26. Apparatus for automatically matching an x-ray image with a reference image, said apparatus comprising:

12

means digitizing said x-ray image and reference image to generate first digital image signals and second digital image signals, respectively;

processing means processing said first and second digital signals without input of any physical dimensions of any features within said images to generate matched digital image signals; and

display means generating a display from said matched digital image signals.

27. The apparatus of claim 26 wherein said processing means comprises coarse alignment means generating coarse aligned digital images signals from said first and second digital image signals, and fine alignment means generating a transform between said coarse aligned digital image signals for overlapping regions of said x-ray and reference images utilizing robust motion flow, and means applying said transform to one of said coarse aligned digital image signals to generate said matched digital image signals.

28. The apparatus of claim 27 wherein said fine alignment means comprises means enhancing said coarse aligned digital image signals to generate prepared coarse aligned image signals having similar dynamic ranges and intensities, and means generating said transform between said prepared coarse aligned digital image signals utilizing robust motion flow.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 1 of 2

PATENT NO. : 5,784,431
DATED : July 21, 1998
INVENTOR(S) : Kalend, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At [56] References Cited, please add the following patents and publications.

OTHER DOCUMENTS

	<i>Digital portal image registration by sequential anatomical matchpoint and image correlations for real-time continuous field alignment verification</i> , Brian J. McParland and J. Carl Kumaradas, Phys. 22(7), July 1995, pp. 1063-1075.
	<i>Neutral Network Object Recognition for Inspection of Patient Setup in Radiation Therapy Using Portal Images</i> , Susan S. Young, et al., 1996 IEEE, pp. 3418-3421.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 2 of 2

PATENT NO. : 5,784,431

DATED : July 21, 1998

INVENTOR(S) : Kalend, et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 9, line 37, after "means" insert --comprising coarse alignment means--.

Column 9, line 38, after "generate" insert --coarse aligned DPIS and DSIS, means determining from said coarse aligned DPIS and DSIS overlapping regions of said simulation and portal images, and fine alignment means generating--.

Column 9, line 38, after "DSIS" insert --from said coarse aligned DPIS and DSIS for said overlapping regions of said simulation and portal images--.

Cancel Claim 2.

Column 9, line 47, change "2" to --1--.

Column 10, line 5, change "2" to --1--.

Signed and Sealed this

Twenty-third Day of February, 1999

Attest:



Q. TODD DICKINSON

Attesting Officer

United States Patent and Trademark Office

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WESTERN PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)
)
Plaintiff,)
) Civil Action No. 2:07-cv-00491-AJS
v.)
) (JURY TRIAL DEMANDED)
VARIAN MEDICAL SYSTEMS, INC.)
) FILED ELECTRONICALLY
)
Defendant.)

**VARIAN MEDICAL SYSTEMS INC.'S ANSWER
AND COUNTERCLAIM**

ANSWER

Varian Medical Systems, Inc. ("Varian") answers the Complaint of University of Pittsburgh ("Plaintiff") as follows:

1. Varian is without knowledge or information sufficient to form a belief as to the truth of the allegations in paragraph 1 of the Complaint, and on that ground Varian denies these allegations.
2. Admitted.
3. Admitted.
4. Admitted.
5. Varian is without knowledge or information sufficient to form a belief as to the truth of the allegations in paragraph 5 of the Complaint, and on that ground Varian denies these allegations.
6. Varian denies each and every allegation of paragraph 6 of the Complaint.
7. Varian denies each and every allegation of paragraph 7 of the Complaint..

8. Varian denies each and every allegation of paragraph 8 of the Complaint.
9. Varian denies each and every allegation of paragraph 9 of the Complaint.
10. Varian denies each and every allegation of paragraph 10 of the Complaint.

AFFIRMATIVE DEFENSES

A. FAILURE TO STATE A CLAIM

11. As its first separate and affirmative defense, Varian alleges that Plaintiff has failed to state a claim upon which any relief may be granted against Varian.

B. PATENT INVALIDITY

12. As its second separate and affirmative defense, Varian alleges that one or more claims of the Patents-in-Suit are invalid because they fail to meet the conditions of patentability of 35 U.S.C. §§ 101, 102, 103, and/or 112.

C. ESTOPPEL

13. As its third separate and affirmative defense, Varian alleges that Count I of the Complaint is barred, in whole or in part, under the doctrine of estoppel. By way of example, and without limitation, Varian alleges that by reason of the proceedings in the United States Patent and Trademark Office during the prosecution of the applications for one or more of the Patents-in-Suit, specifically the admissions, representations, and amendments made on behalf of the applicants for said patents, Plaintiff is estopped from (1) asserting any construction of the claims of said patents such that they would read upon any product made, used, sold, or offered for sale in, or imported into, the United States by Varian, or (2) extending the coverage of the claims of said patents under the doctrine of equivalents such that they would read upon any such Varian product.

D. LACHES

14. As its fourth separate and affirmative defense, Varian alleges that Count I of the Complaint is barred, in whole or in part, under the doctrine of laches. By way of example, and without limitation, Varian alleges, on information and belief, that plaintiff's claims under the Patents-In-Suit are barred by the doctrine of laches because (1) Plaintiff knew of Varian's allegedly infringing actions, (2) Plaintiff inexcusably failed to pursue its infringement claims in a timely and diligent manner from the time it became aware it had claims against Varian, and (3) Varian has been materially prejudiced by Plaintiff's inexcusable lack of diligence.

E. AUTHORIZATION AND CONSENT OF THE UNITED STATES GOVERNMENT

15. As its sixth separate and affirmative defense, Varian alleges that it used and/or manufactured some of the products accused of infringing the Patents-in-Suit for and with the authorization and consent of the United States Government and that, accordingly, plaintiff's claims against Varian with respect to such products may not be pursued in this Court and are subject to other limitations pursuant to 28 U.S.C. § 1498.

PRAYER FOR RELIEF

Varian prays that this Court enter judgment:

- A. That plaintiff takes nothing by way of Count I for patent infringement.
- B. That plaintiff be denied any remedies available under 35 U.S.C. §284.
- C. That the Court deny plaintiff any injunction relief;
- D. That the Court deny plaintiff any other relief as to Count I;
- E. That the Court declare this to be an exceptional case and award Varian its attorney's fees as the prevailing party pursuant to 35 U.S.C. §285;

- F. That the Court award Varian its costs of suit; and
- G. That the Court award Varian any other relief as the Court deems proper.

VARIAN MEDICAL SYSTEMS, INC.'S COUNTERCLAIMS

Counter-Claimant Varian Medical Systems, Inc. submits this counterclaim pursuant to Federal Rule of Civil Procedure 13. Varian alleges:

1. Varian's first cause of action is for declaratory relief pursuant to the Declaratory Judgment Act, 28 U.S.C. §§ 2201 *et seq.* Varian's first cause of action arises under the patent laws of the United States. 35 U.S.C. §§ 100 *et seq.* This Court has subject matter jurisdiction over Varian's counterclaim under 28 U.S.C. §§ 1331, 1338, and 1367.
2. Varian is a Delaware corporation maintaining its principal place of business at 3100 Hansen Way, Palo Alto, California.
3. Upon information and belief, Counter-Defendant University of Pittsburgh ("Plaintiff") is an academic institution with its principal place of business in Pittsburgh, Pennsylvania.
4. This Court has personal jurisdiction over Plaintiff at least because Plaintiff submitted itself to this Court's personal jurisdiction by suing Varian in this Court.
5. Venue is proper in this Court pursuant to 28 U.S.C. §1391(b).

FIRST COUNTERCLAIM

6. As its first counterclaim for declaratory relief, Varian alleges that the '554 and '431 patents are invalid because they fail to meet the conditions of patentability of 35 U.S.C. §§ 101, 102, 103, and/or 112.

SECOND COUNTERCLAIM

7. As its second counterclaim for declaratory relief, Varian alleges that Varian's products do not infringe any claims of the '554 and '431 patents.

PRAYER FOR RELIEF

WHEREFORE, Varian prays that this Court enter judgment:

- A. That the '554 and '431 patents be invalid;
- B. That Varian's products do not infringe any of the claims of the '554 and '431 patents;
- C. That Plaintiff be ordered to pay the costs and reasonable attorneys' fees incurred by Varian pursuant to 35 U.S.C. § 285; and
- D. That Varian be granted such other and further relief as this Court deems just and warranted under the circumstances.

JURY DEMAND

Varian demands a trial by jury as to all issues so triable.

Respectfully submitted,

PICADIO SNEATH MILLER & NORTON P.C.

/s/ Henry M. Sneath

Henry M. Sneath (PA 40559)
Shannon M. Clougherty (PA 88586)
4710 U.S. Steel Tower
600 Grant Street
Pittsburgh, Pennsylvania 15219-2702
*Attorneys for Defendant Varian Medical Systems,
Inc.*

William L. Anthony
Matthew H. Poppe
Zheng Liu
Orrick, Herrington & Sutcliffe LLP
1000 Marsh Road
Menlo Park, California 94025
Tel: 650-614-7400

Veronica Mullally
Eileen M. O'Connor
Orrick, Herrington & Sutcliffe LLP
666 5th Ave.
New York, NY 10103-0001
Tel: 212-506-5000
Fax: 212-506-5151

Dated: May 14, 2007

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the VARIAN MEDICAL SYSTEMS INC.'S ANSWER AND COUNTERCLAIM (which has been electronically filed and is available for viewing and downloading from the ECF system) has been served upon all parties either individually or through counsel via:

- Hand-Delivery
- Facsimile
- First Class, US Mail, Postage Prepaid
- Certified Mail-Return Receipt Requested
- ECF Electronic Service

at the following addresses:

Christopher K. Ramsey
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
cramsey@morganlewis.com

David W. Marston Jr.
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
dmarston@morganlewis.com

Daniel Johnson, Jr.
Allison K. Young
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Squire, Suite 700
3000 El Camino Real
Palo Alto, CA
djohnson@morganlewis.com
allison.young@morganlewis.com

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: May 14, 2007

/s/ Henry M. Sneath

Henry M. Sneath, Esquire
Pa. I.D. No. 40559
Shannon M. Clougherty, Esquire
Pa. I.D. No. 88586
4710 US Steel Tower
600 Grant Street
Pittsburgh, PA 15219-2709
Counsel for Defendant

EXHIBIT C

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH

Case 2:07-cv-00491-AJS

Plaintiff,

v.

Judge Arthur J. Schwab

VARIAN MEDICAL SYSTEMS, INC.,

Filed Electronically

Defendant.

CASE MANAGEMENT ORDER

AND NOW, this 4th day of June of 2007,

IT IS ORDERED that this action is placed under the Local Patent Rules of this Court for pretrial proceedings.

IT IS ORDERED that counsel shall confer with their clients prior to all scheduling, status, or pretrial conferences to obtain authority to participate in settlement negotiations which may be conducted or ordered by the Court.

IT IS FURTHER ORDERED that compliance with provisions of Local Rule 16 and the Local Patent Rules shall be completed as follows:

- (1) Plaintiff and Defendant may modify the default protective order currently in place and reach agreement on a final protective order by 5:00 p.m. EST on **May 23, 2007**. If such an agreement cannot be reached, Plaintiff and Defendant may each submit a proposed protective order to the Court by Noon EST on **May 24, 2007**.
- (2) Plaintiff and Defendant will exchange the information required by Federal Rule of Civil Procedure 26(a)(1) by **May 30, 2007**; they will produce the documents required by Local Patent Rule 3.1 by **May 30, 2007**; and they will produce any other documents identified in their respective initial disclosures by **June 11, 2007**. Plaintiff and Defendant further agree that as part of Defendant's initial disclosures, Defendant will produce technical information for current products and current versions of software. Defendant will diligently search for archived technical information, and Plaintiff and Defendant further agree that Defendant will produce said archived technical information as soon as possible.

PLAINTIFF'S FURTHER PROPOSAL:

On or before June 11, 2007, Defendant shall

Plaintiff and Defendant further agree not to conduct the ENE until after Defendant has produced all technical information for both current and archived versions of software and Plaintiff has had adequate time to review such technical information and software.

Any such documents that are obtained, identified, located, or generated after June 11, 2007 in the exercise of reasonable diligence shall be produced on an ongoing basis in accordance with the Federal Rules of Civil Procedure.

DEFENDANT'S FURTHER PROPOSAL:

Plaintiff and Defendant further agree that Defendant will use its best efforts to timely produce all technical information for both current and archived versions of software and that Plaintiff will use its best efforts to timely review of such information to facilitate an ENE prior to July 16, 2007.

Any such documents that are obtained, identified, located, or generated after June 11, 2007 in the exercise of reasonable diligence shall be produced on an ongoing basis in accordance with the Federal Rules of Civil Procedure.

- (3) The Parties shall exchange privilege logs beginning on **June 18, 2007**, and then on an ongoing basis as provided for by the Federal Rules of Civil Procedure.

DEFENDANT'S FURTHER PROPOSAL:

All privileged documents shall be logged no later than **30** days before the close of fact discovery; and any opinion of counsel upon which either party intends to rely shall be produced along with all materials within the scope of the waiver of the attorney-client privilege and/or the attorney work product doctrine within **60** days following the Court's entry of its ruling on Claim Construction. Also within **60** days following the Court's entry of its ruling on Claim Construction, the party producing any such opinion shall disclose the identity of the opinion counsel, the recipient of each opinion, and if different the person who relied on each opinion. The party receiving the documents shall have **30** days from receipt thereof to depose the opinion counsel, the recipient of each opinion, and if different, the person who relied on each opinion.

- (4) The parties shall move to amend the pleadings or add new parties by **June 15, 2007**.

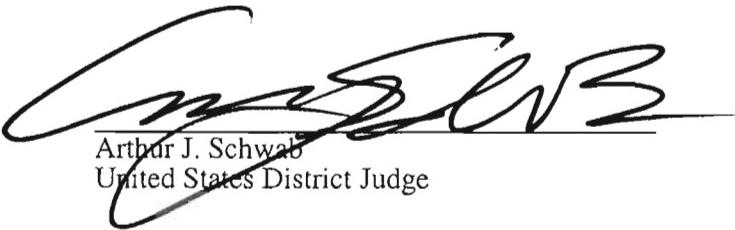
DEFENDANT'S FURTHER PROPOSAL:

The above deadline shall be subject to Defendant's reservation of its right to assert an inequitable conduct defense at a later date, and further subject to either party's right to seek leave to make other amendments at a later time based on new information discovered through the exercise of reasonable diligence and under the standards set forth in Federal Rule of Civil Procedure 15 and applicable case law.

- (5) The party claiming patent infringement must serve on all parties a Disclosure of Asserted Claims and Infringement Contentions by **June 15, 2007**.

- (6) The party claiming non-infringement and/or invalidity must serve on all parties a Disclosure of Non-Infringement and Invalidity Contentions by **July 2, 2007**.
- (7) The parties will simultaneously exchange Proposed Claim Terms and Phrases for Construction by **July 12, 2007**.
- (8) The parties shall complete the Court-ordered ADR process on or before **July 16, 2007** and submit a report to the Court regarding the outcome of the process on or before **July 23, 2007**.
- (9)(a) The parties shall meet and confer by **August 3, 2007**, in order to identify claim terms and phrases that are in dispute, and claim terms and phrases that are not in dispute.
- (9)(b) The parties shall prepare and file a Joint Disputed Claim Terms Chart by **August 15, 2007** according to LPR 4.2. Each party shall also file with the Joint Disputed Claim Terms Chart an appendix containing a copy of each item of intrinsic evidence cited by the party in the Joint Disputed Claim Terms Chart.
- (9)(c) The parties shall discuss with each other and then suggest to the Court by **August 15, 2007** their proposed process for a Claim Construction hearing, including whether the parties intend to use extrinsic evidence (including lay and/or expert witnesses) during the Claim Construction hearing.
- (9)(d) In the event expert witnesses are to be used, the parties propose the following schedule of expert reports and discovery in connection with those witnesses:
 - (i) Date by which the parties' expert reports regarding claim construction should be filed **August 15, 2007**.
 - (ii) Date by which depositions of the parties' expert(s) regarding claim construction should be completed **September 4, 2007**.
- (10) The parties shall complete fact discovery by **October 5, 2007**, and all interrogatories, depositions, requests for admissions, and requests for production shall be served within sufficient time to allow responses to be completed prior to the close of discovery.
- (11) Plaintiff shall file and serve an Opening Claim Construction Brief, and an identification of extrinsic evidence, according to LPR 4.3(a) and (b), by **October 19, 2007**.
- (12) Defendant shall file and serve a Response to the Opening Claim Construction Brief, an identification of extrinsic evidence and any objections to extrinsic evidence, according to LPR 4.3(c) and (d), by **November 2, 2007**.
- (13) Plaintiff may serve and file a Reply directly rebutting Defendant's Response, and any objections to extrinsic evidence, according to LPR 4.3(e) by **November 9, 2007**.
- (14) The Court will conduct a hearing on the issue of Claim Construction on **November 29, 2007 at 9:00 am**.
- (15) The parties propose that the Court schedule a further Case Management Conference to occur after the Court issues its Claim Construction order for the purpose of issuing a further scheduling order addressing deadlines for subsequent events. The parties will meet and confer regarding proposed deadlines and file their joint or separate proposals with the Court in advance of that Case Management Conference.

IT IS SO ORDERED.



Arthur J. Schwab
United States District Judge

For Plaintiff:

/s/ *Rita E. Tautkus*

Daniel Johnson, Jr. (admitted p.h.v.)
Rita E. Tautkus (admitted p.h.v.)
Allison K. Young (admitted p.h.v.)
2 Palo Alto Square
3000 El Camino Real, Suite 700
Palo Alto, CA 94306
(650-843-4000)

For Defendant:

/s/ *Henry M. Sneath*

Henry M. Sneath (Pa. I.D. 40559)
Shannon M. Clougherty (Pa. I.D. 88586)
Picadio Sneath Miller & Norton, P.C.
600 Grant Street - 4710 U.S. Steel Building
Pittsburgh, PA 15219-2702
(412-288-4013)

EXHIBIT D

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH,

Plaintiff,

07cv0491

ELECTRONICALLY FILED

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

ORDER OF COURT RE: DEPOSITION SCHEDULE

AND NOW, this 5th day of October, 2007, upon consideration of the Plaintiff University of Pittsburgh's Emergency Motion to Compel Defendant to Conduct Depositions in Compliance with Court Orders (doc. no. 72); Defendant Varian Medical Systems, Inc.'s Emergency Counter-Motion to Compel Plaintiff to Cooperate in Deposition Scheduling (doc. no. 76); and response thereto (doc. no. 81); it is hereby ORDERED, ADJUDGED, and DECREED that the foregoing Motions are GRANTED in part and DENIED in part, as follows:

1. Since counsel for the parties have been unable or unwilling to establish a mutually agreeable deposition schedule for certain depositions, and since the parties through the above referenced Motions have asked the Court to micro-manage the deposition schedule, the Court will do so.

2. Defendant shall produce the following individuals for depositions, and Plaintiff shall take depositions in Pittsburgh, PA, as follows:

- a. Defendant's Rule 30(b)(6) witness(es) on topics 9, 10, 14, 15, 17, 21, 22(b)-(c), 23, and 24 of Plaintiff's Notice of Rule 30(b)(6) Deposition and Rule 30(b)(5) Request for Production of Documents (excluding privileged information) 10/15-16/07
- b. Stan Mansfield 10/17/07
- c. Peter Munro 10/18/07

3. Plaintiff shall produce the following individuals for depositions, and Defendant shall take depositions in Pittsburgh, PA, as follows:

- a. Plaintiff's Rule 30(b)(6) witness(es) on topics 4, 16-18, 20, 26-27, and 31-41 of Varian's Notice of Deposition of Plaintiff University of Pittsburgh Pursuant to FRCP 30(b)(6) (excluding privileged information) 10/22-23/07
- b. Dr. Joel Greenberger (not to exceed 10 hours in total) 10/24-25/07
- c. Charalambos Athanassiou (unless plaintiff's counsel files on or before 10/18/07 an appropriate affidavit demonstrating good faith efforts of plaintiff's counsel to secure the appearance of deponent) 10/26/07

4. Any party who fails to produce any of the above deponents on the above schedule shall be sanctioned in the amount of \$20,000 per deposition.

5. Any party responsible for taking any of the above depositions who fails to conduct said deposition(s) on the above schedule shall be sanctioned in the amount of \$20,000 per deposition.

6. The respective parties' request for attorney fees, travel expenses and/or other costs are DENIED.

7. Discovery closes today on October 5, 2007 as previously ordered, except as provided above. Any discovery, including Rule 30(b)(6) depositions, beyond the above would violate prior Orders of Court.

s/ Arthur J. Schwab
Arthur J. Schwab
United States District Judge

cc: All Registered ECF Counsel and Parties

Escamilla, Diane

From: ecf_intake_pawd@pawd.uscourts.gov
Sent: Friday, October 05, 2007 9:38 AM
To: pawd_ecf@pawd.uscourts.gov
Subject: Activity in Case 2:07-cv-00491-AJS UNIVERSITY OF PITTSBURGH v. VARIAN MEDICAL SYSTEMS, INC. Order on Motion to Compel

This is an automatic e-mail message generated by the CM/ECF system. Please DO NOT RESPOND to this e-mail because the mail box is unattended.

NOTE TO PUBLIC ACCESS USERS You may view the filed documents once without charge. To avoid later charges, download a copy of each document during this first viewing.

U.S. District Court

Western District of Pennsylvania

Notice of Electronic Filing

The following transaction was entered on 10/5/2007 at 12:38 PM EDT and filed on 10/5/2007

Case Name: UNIVERSITY OF PITTSBURGH v. VARIAN MEDICAL SYSTEMS, INC.

Case Number: 2:07-cv-491

Filer:

Document Number: 83

Docket Text:

ORDER granting in part and denying in part [72] Motion to Compel; granting in part and denying in part [72] Motion for Discovery; granting in part and denying in part [76] Motion to Compel. Signed by Judge Arthur J. Schwab on 10/5/07. (ms)

2:07-cv-491 Notice has been electronically mailed to:

John R. Kenrick jkenrick@eckertseamans.com

Henry M. Sneath hsneath@psmn.com, dmeyer@psmn.com

Christopher K. Ramsey cramsey@morganlewis.com, dbilski@morganlewis.com, ddugas@morganlewis.com, kxander@morganlewis.com, slewis@morganlewis.com, tstamerra@morganlewis.com

William L. Anthony, Jr wanthonry@orrick.com, shart@orrick.com

Shannon M. Clougherty sclougherty@psmn.com

John H. Perkins perkins@acba.org

Donald E. Ziegler coopzieg@aol.com

Allison K. Young allison.young@morganlewis.com, ahoffman@morganlewis.com, mboensch@morganlewis.com, mjensen@morganlewis.com, nnelson@morganlewis.com, talexander@morganlewis.com, tmajidian@morganlewis.com

Daniel Johnson, Jr djjohnson@morganlewis.com

Rita E. Tautkus rtautkus@morganlewis.com

John D. Zele jzele@morganlewis.com

Matthew H. Poppe mpoppe@orrick.com, descamilla@orrick.com, jryan@orrick.com

Zheng Liu jenliu@orrick.com
Darcy A. Paul dpaul@morganlewis.com, ahoffman@morganlewis.com,
mboensch@morganlewis.com, michael.nguyen@morganlewis.com, mjensen@morganlewis.com,
nnelson@morganlewis.com, tmajidian@morganlewis.com
M. Brendan Smith mbsmith@orrick.com
Bradford A. Cangro bcangro@morganlewis.com
Michael F. Heafey mheafey@orrick.com

2:07-cv-491 Filer will deliver notice by other means to:

The following document(s) are associated with this transaction:

Document description: Main Document

Original filename: n/a

Electronic document Stamp:

[STAMP_dcecfStamp_ID=1098469114 [Date=10/5/2007] [FileNumber=1120286-0
] [a84dc0d0978ccc9edfd4903d0beab92bd5707f42905e89c09a32641cb6ded645891
.c935ba63bee851a98c3e8228e10c7c4d58b7f7b2f37fda28a1c19c6b9a5ac]]

EXHIBIT E

APPEAL, CLOSED, PAT/TRADE, SM, STAYED

**U.S. District Court
Western District of Pennsylvania (Pittsburgh)
CIVIL DOCKET FOR CASE #: 2:07-cv-00491-AJS**

UNIVERSITY OF PITTSBURGH v. VARIAN MEDICAL SYSTEMS, INC. Date Filed: 04/13/2007
Assigned to: Arthur J. Schwab Date Terminated: 04/30/2008
Cause: 35:271 Patent Infringement Jury Demand: Both
Nature of Suit: 830 Patent Jurisdiction: Federal Question

Special Master

JUDGE DONALD E. ZIEGLER

represented by **Donald E. Ziegler**
Cooper & Ziegler
100 Ross Street
Pittsburgh, PA 15219
(412) 281-6770
Fax: 412-391-7397
Email: coopzieg@aol.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Plaintiff

UNIVERSITY OF PITTSBURGH

represented by **Allison K. Young**
Morgan, Lewis & Bockius
2 Palo Alto Square
3000 El Camino Real
Suite 700
Palo Alto, CA 94306
(650) 843-7574
Email:
allison.young@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Bradford A. Cangro
Morgan, Lewis & Bockius
1111 Pennsylvania Avenue, NW
Washington, DC 20004
(202) 739-5088
Email: bcangro@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Christopher K. Ramsey

Morgan, Lewis & Bockius
301 Grant Street
One Oxford Centre, Suite 3200
Pittsburgh, PA 15219-6401
(412) 560-3300
Email: cramsey@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Daniel Johnson, Jr.
Morgan, Lewis & Bockius
One Market
Spear Street Tower
San Francisco, CA 94306
(415) 442-1392
Email: djohnson@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Darcy A. Paul
Morgan, Lewis & Bockius
2 Palo Alto Square
3000 El Camino Real
Suite 700
Palo Alto, CA 94306
(650) 843-7249
Email: dpaul@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Elizabeth Stroyd Windsor
Morgan, Lewis & Bockius
301 Grant Street
One Oxford Centre, Suite 3200
Pittsburgh, PA 15219-6401
(412) 560-3362
Email: ewindsor@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

John D. Zele
Morgan, Lewis & Bockius
1111 Pennsylvania Avenue, N.W.
Washington, DC 20004
(202) 739-5418
Email: jzele@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Rita E. Tautkus

Morgan, Lewis & Bockius
One Market
Spear Street Tower
San Francisco, CA 94306
(415) 442-1357
Email: rtautkus@morganlewis.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Richard J. Johnson
1201 Pennsylvania Ave., NW
Washington, DC 20004
202-662-5323
Email: rjohnson@cov.com
ATTORNEY TO BE NOTICED

Roderick R. McKelvie
Covington & Burling LLP
1201 Pennsylvania Avenue NW
Washington, DC 20004
202-662-5195
Fax: 202-778-5195
Email: rmckelvie@cov.com
ATTORNEY TO BE NOTICED

V.

Defendant

**VARIAN MEDICAL SYSTEMS,
INC.**

represented by **Eileen O'Connor**
Orrick Herrington & Sutcliffe LLP
666 Fifth Avenue
New York, NY 10103-0001
(212) 506-5000
Email: eoconnor@orrick.com
LEAD ATTORNEY

Henry M. Sneath
Picadio, Sneath, Miller & Norton
4710 U.S. Steel Tower
600 Grant Street
Pittsburgh, PA 15219-2702
(412) 288-4000
Email: hsneath@psmn.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

M. Brendan Smith
Orrick, Herrington & Sutcliffe
666 Fifth Avenue
New York, NY 10103

(212) 506-5298
Email: mbsmith@orrick.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Matthew H. Poppe
Orrick, Herrington & Sutcliffe
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
Email: mpoppe@orrick.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Michael F. Heafey
Orrick, Herrington & Sutcliffe
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7645
Email: mheafey@orrick.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Shannon M. Clougherty
Picadio, Sneath, Miller & Norton
4710 U.S. Steel Tower
600 Grant Street
Pittsburgh, PA 15219-2702
(412) 288-4385
Email: sclougherty@psmn.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Veronica Mullally
Orrick, Herrington & Sutcliffe
666 Fifth Avenue
New York, NY 10103
(212) 506-5000
Email: vmullally@orrick.com
LEAD ATTORNEY

William L. Anthony, Jr.
Orrick, Herrington & Sutcliffe
1020 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
Email: wanthonry@orrick.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Zheng Liu
Orrick Herrington & Sutcliffe LLP
1000 Marsh Road
Menlo Park, CA 94025-1015
(650) 614-7699
Email: jenliu@orrick.com
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Counter Claimant

**VARIAN MEDICAL SYSTEMS,
INC.**

represented by **Henry M. Sneath**
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

M. Brendan Smith
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Shannon M. Clougherty
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

V.

Counter Defendant

UNIVERSITY OF PITTSBURGH

represented by **Daniel Johnson, Jr.**
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Elizabeth Stroyd Windsor
(See above for address)
LEAD ATTORNEY
ATTORNEY TO BE NOTICED

Richard J. Johnson
(See above for address)
ATTORNEY TO BE NOTICED

Roderick R. McKelvie
(See above for address)
PRO HAC VICE
ATTORNEY TO BE NOTICED

Date Filed	#	Docket Text

04/13/2007	1	COMPLAINT against VARIAN MEDICAL SYSTEMS, INC. (Filing fee \$ 350 receipt number 3692), filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Civil Cover Sheet # 2 Exhibit A# 3 Exhibit B# 4 Receipt Filing Fee)(plh) (Entered: 04/13/2007)
04/13/2007		E-mail notification to the U.S. Patent and Trademark Office with complaint attached was sent on 4/13/2007. (plh) (Entered: 04/13/2007)
04/13/2007	2	MOTION for attorney Allison K. Young to Appear Pro Hac Vice <i>Motion and Affidavit for Admission Pro Hac Vice of Allison K. Young</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit Ex. A (Allison Young Certificate of Good Standing for USDC NDCA)# 2 Exhibit Ex. B [Proposed] Order for Pro Hac Vice Admission (for Allison K. Young))(Young, Allison) (Entered: 04/13/2007)
04/16/2007	3	NOTICE that instant civil action has been designated for placement into the United States District Court's Alternative Dispute Resolution program. Parties are directed to fully complete the required 26(f) report, which includes the stipulation of selecting an ADR process. Counsel for plaintiff (or in the case of a removal action, counsel for removing defendant) shall make service of the notice on all parties.(ms) (Entered: 04/16/2007)
04/16/2007	4	Pro Hac Vice Fees received in the amount \$ 40.00 receipt # 3722 re 2 Motion to Appear Pro Hac Vice for Allison K. Young (klm). (Entered: 04/16/2007)
04/17/2007	5	ORDER SETTING INITIAL CASE MANAGEMENT CONFERENCE for May 16, 2007 at Noon. Signed by Judge Arthur J. Schwab on 4/17/07. (ms) (Entered: 04/17/2007)
04/17/2007		ORDER Counsel for plaintiffs is hereby directed to immediately serve the Order Setting Initial Case Management Conference together with the Complaint upon defendant or counsel for defendant. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 4/17/07. (ms) (Entered: 04/17/2007)
04/17/2007	6	Disclosure Statement identifying None as Corporate Parent by UNIVERSITY OF PITTSBURGH. (Ramsey, Christopher) Docket text modified on 4/18/2007 (sj). (Entered: 04/17/2007)
04/19/2007		ORDER granting 2 Motion to Appear Pro Hac Vice. Attorney Allison K. Young added. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 4/19/07. (smk) (Entered: 04/19/2007)
04/19/2007	7	PRAECIPE to Issue Summons by UNIVERSITY OF PITTSBURGH (Young, Allison) (Entered: 04/19/2007)
04/20/2007		Summons Issued as to VARIAN MEDICAL SYSTEMS, INC. (eca) (Entered: 04/20/2007)
04/23/2007	8	SUMMONS/Return of Service Returned Executed by UNIVERSITY OF

		PITTSBURGH. VARIAN MEDICAL SYSTEMS, INC. served on 4/23/2007, answer due 5/14/2007. (Young, Allison) (Entered: 04/23/2007)
04/24/2007	9	MOTION for attorney Daniel Johnson, Jr. to Appear Pro Hac Vice <i>Motion and Affidavit for Admission Pro Hac Vice of Daniel Johnson, Jr.</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A (Daniel Johnson Certificate of Good Standing for USDC NDCA)# 2 Exhibit B [Proposed] Order for Pro Hac Vice Admission (for Daniel Johnson, Jr.))(Johnson, Daniel) (Entered: 04/24/2007)
04/24/2007	10	MOTION for attorney Rita E. Tautkus to Appear Pro Hac Vice <i>Motion and Affidavit for Admission Pro Hac Vice of Rita E. Tautkus</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A (Rita Tautkus Certificate of Good Standing for USDC NDCA)# 2 Exhibit B [Proposed] Order for Pro Hac Vice Admission (for Rita E. Tautkus)) (Tautkus, Rita) (Entered: 04/24/2007)
04/25/2007		ORDER granting 9 & 10 Motions to Appear Pro Hac Vice. Attorneys Tautkus and Johnson added for UNIVERSITY OF PITTSBURGH. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 4/25/07. (smk) (Entered: 04/25/2007)
04/30/2007	11	Pro Hac Vice Fees received in the amount \$ 80 receipt # 3983 re 9 Motion to Appear Pro Hac Vice,, 10 Motion to Appear Pro Hac Vice, (brs) (Entered: 04/30/2007)
05/04/2007	12	NOTICE of Appearance by Henry M. Sneath on behalf of VARIAN MEDICAL SYSTEMS, INC. (Sneath, Henry) (Entered: 05/04/2007)
05/10/2007	13	MOTION for attorney William L. Anthony, Jr. to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order)(Sneath, Henry) (Entered: 05/10/2007)
05/10/2007	14	MOTION for attorney Zheng Liu to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order)(Sneath, Henry) (Entered: 05/10/2007)
05/10/2007	15	MOTION for attorney Veronica Mullally to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order)(Sneath, Henry) (Entered: 05/10/2007)
05/10/2007	16	MOTION for attorney M. Eileen O'Connor to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order)(Sneath, Henry) (Entered: 05/10/2007)
05/10/2007	17	MOTION for attorney Matthew H. Poppe to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order)(Sneath, Henry) (Entered: 05/10/2007)
05/10/2007	18	Pro Hac Vice Fees received in the amount \$40.00 each, Receipt # 4232 re 15 Motion for Veronica Mullally to Appear Pro Hac Vice, 17 Motion for Matthew Poppe to Appear Pro Hac Vice, 14 Motion for Zheng Liu to

		Appear Pro Hac Vice, 16 Motion for M. Eileen O'Connor to Appear Pro Hac Vice, and 13 Motion for William Anthony, Jr. to Appear Pro Hac Vice. (eca) (Entered: 05/10/2007)
05/14/2007		ORDER granting 13 14 15 16 & 17 Motions to Appear Pro Hac Vice. Each attorney is ORDERED to become a register user of this district's ECF System within five (5) days of the date of this order. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order or Notice of the Court on the matter. Signed by Judge Arthur J. Schwab on 5/14/07. (smk) (Entered: 05/14/2007)
05/14/2007	19	Disclosure Statement by VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 05/14/2007)
05/14/2007	20	ANSWER to Complaint with Jury Demand, COUNTERCLAIM against UNIVERSITY OF PITTSBURGH by VARIAN MEDICAL SYSTEMS, INC..(Sneath, Henry) (Entered: 05/14/2007)
05/14/2007	21	Proposed Case Management Order by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 05/14/2007)
05/14/2007	22	REPORT of Rule 26(f) Planning Meeting. (Sneath, Henry) (Entered: 05/14/2007)
05/14/2007	23	STIPULATION selecting ADR process by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.(Sneath, Henry) (Entered: 05/14/2007)
05/15/2007		ORDER re 23 Stipulation Selecting ADR Process filed by UNIVERSITY OF PITTSBURGH,, VARIAN MEDICAL SYSTEMS, INC. Said Stipulation is incomplete as to sharing the costs of the ADR process and as to identifying a list of three individuals from which to select the neutral. The parties are directed to file a completed Revised Stipulation Selecting ADR Process by 3:00 pm, May 15, 2007. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order or Notice of the Court on the matter. Signed by Judge Arthur J. Schwab on 5/15/07. (mjl,) (Entered: 05/15/2007)
05/15/2007	24	Revised STIPULATION selecting ADR process by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.(Sneath, Henry) Docket text modified on 5/16/2007 (sj). (Entered: 05/15/2007)
05/16/2007		Minute Entry for proceedings held before Judge Arthur J. Schwab: Case Management Conference held on 5/16/2007. Parties are to file with the Court by 5:00 pm on 5/21/07 a consented-to Case Management Order. Parties agreed to Early Neutral Evaluation before John H. Perkins. Hon. Donald Ziegler will be appointed Special Master. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. (Court Reporter V. Pease) (ms) (Entered: 05/16/2007)
05/16/2007	25	ORDER REFERRING CASE to Early Neutral Evaluation, followed by

		mediation. John H. Perkins is appointed as an evaluator. Evaluation shall occur by 7/16/07. Signed by Judge Arthur J. Schwab on 5/16/07. (ms) (Entered: 05/16/2007)
05/16/2007	26	ORDER REFERRING CASE to Special Master. DONALD E. ZIEGLER is appointed Special Master. Signed by Judge Arthur J. Schwab on 5/16/07. (ms) (Entered: 05/16/2007)
05/21/2007	27	REPORT of Rule 26(f) Planning Meeting. (Sneath, Henry) (Entered: 05/21/2007)
05/21/2007	28	Proposed Case Management Order by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 05/21/2007)
05/24/2007	29	Proposed Order (<i>Protective Order</i>) by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 05/24/2007)
06/01/2007		ORDER APPROVING 29 Proposed Protective Order. SO ORDERED. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 6/01/07. (smk) (Entered: 06/01/2007)
06/04/2007	30	CASE MANAGEMENT ORDER: Fact discovery due by 10/5/2007. Plaintiff Opening Claim Construction Brief due 10/19/2007. Defendant Response due 11/02/2007. Reply due 11/09/2007. Hearing on Issue of Claim Construction set for 11/29/2007 09:00 AM before Arthur J. Schwab. Signed by Judge Arthur J. Schwab on 6/04/07. (smk) (Entered: 06/04/2007)
06/04/2007	31	NOTICE of Appearance by Shannon M. Clougherty on behalf of VARIAN MEDICAL SYSTEMS, INC., VARIAN MEDICAL SYSTEMS, INC. (Clougherty, Shannon) (Entered: 06/04/2007)
06/06/2007	32	<i>Plaintiff and Counterclaim Defendant University of Pittsburgh's Reply to Counterclaims of Defendant Varian Medical Systems, Inc.</i> ANSWER to Complaint with Jury Demand by UNIVERSITY OF PITTSBURGH. (Johnson, Daniel) Modified on 6/7/2007 (sj). ERROR: Wrong event selected. CORRECTION: Redocketed as an Answer to Counterclaim. This document is terminated and removed from public view. (Entered: 06/06/2007)
06/06/2007	33	ANSWER to 20 Counterclaim by UNIVERSITY OF PITTSBURGH. "Document previously filed electronically."(sj) (Entered: 06/07/2007)
06/07/2007		CLERK'S OFFICE QUALITY CONTROL MESSAGE. ERROR: re 32 Answer to Complaint. Wrong event selected. CORRECTION: Redocketed as an Answer to Counterclaim. This message is for informational purposes only. (sj) (Entered: 06/07/2007)
06/25/2007	34	Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringment Contentions.pdf <i>and for Protective Order</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed

		Order Granting Varian Medical System's Motion to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf)(Poppe, Matthew) (Entered: 06/25/2007)
06/25/2007	35	BRIEF by VARIAN MEDICAL SYSTEMS, INC. in Support of 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf <i>and for Protective Order. Memorandum of Law in Support of Emergency Motion to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions and Protective Order</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G)(Poppe, Matthew) (Entered: 06/25/2007)
06/25/2007	36	DISCOVERY DISPUTE CERTIFICATE by VARIAN MEDICAL SYSTEMS, INC. re 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf <i>and for Protective Order.</i> (Poppe, Matthew) (Entered: 06/25/2007)
06/25/2007		MOTION for Protective Order (filed with Docket Entry # 34 MOTION to Compel) by VARIAN MEDICAL SYSTEMS, INC. (sjs) (Entered: 06/26/2007)
06/26/2007		ORDER Response/Briefing Schedule re 34 Motion to Compel, Brief in Opposition due by noon on 6/28/2007.,Response to Motion due by noon on 6/28/2007.Text-only entry; no PDF document will issue. This text-only entry constitutes the Order or Notice of the Court on the matter. Signed by Judge Arthur J. Schwab on 6/26/07. (mjl) (Entered: 06/26/2007)
06/26/2007		CLERK'S OFFICE QUALITY CONTROL MESSAGE. re 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf <i>and for Protective Order.</i> ERROR: MULTIPLE Relief Motion Filed as One Relief. CORRECTION: Attorney advised in future that Motions of this nature are to be filed using the Motion Event and choosing all the Reliefs requested by holding the Control Key down and clicking all the reliefs sought in said motion. Clerk of Court docketed Motion for Protective Order. This message is for informational purposes only. (sjs) (Entered: 06/26/2007)
06/26/2007		CLERK'S OFFICE QUALITY CONTROL MESSAGE. re 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf <i>and for Protective Order,</i> 36 Discovery Dispute Certificate, 35 Brief in Support of Motion to Compel. ERROR: Signature on document and filer do not match. CORRECTION: Attorney advised of signature requirements. Attorney to resubmit the documents using the Errata event. This message is for informational purposes only. (sjs) (Entered: 06/26/2007)
06/26/2007	37	Errata re 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringement Contentions.pdf <i>and for</i>

		<i>Protective Order</i> by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Signature on document & filer do not match. (Attachments: # 1 Attachment)(Sneath, Henry) (Entered: 06/26/2007)
06/26/2007	38	Errata re 35 Brief in Support - Other,, <i>Varian's Memorandum of Law in Support of Emergency Motion to Compel Plaintiff to Provide Further Infringement Contention and for Protective Order</i> by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Signature on document & filer do not match. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G)(Sneath, Henry) (Entered: 06/26/2007)
06/26/2007	39	Errata re 36 Discovery Dispute Certificate <i>Pursuant to L.R. 37.1</i> by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Signature on document and filer do not match. (Sneath, Henry) (Entered: 06/26/2007)
06/28/2007	40	BRIEF in Opposition re 34 Emergency MOTION to Compel Plaintiff University of Pittsburgh to Provide Further Infringment Contentions.pdf and for Protective Order filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Proposed Order)(Tautkus, Rita) (Entered: 06/28/2007)
06/29/2007	41	ORDER denying 34 Motion to Compel/Motion for Protective Order. Signed by Judge Arthur J. Schwab on 6/29/07. (smk) (Entered: 06/29/2007)
06/29/2007	42	Consent MOTION to Extend Time to Complete ADR Process by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order)(Sneath, Henry) (Entered: 06/29/2007)
07/02/2007	43	ORDER granting 42 Motion to Extend Time for Completion of ADR Process. ADR process shall be completed by 8/31/2007. Signed by Judge Arthur J. Schwab on 7/02/07. (smk) (Entered: 07/02/2007)
08/01/2007	44	MOTION for attorney Darcy A. Paul to Appear Pro Hac Vice <i>Motion and Affidavit for Admission Pro Hac Vice of Darcy A. Paul</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B)(Paul, Darcy) (Entered: 08/01/2007)
08/02/2007	45	ORDER granting 44 Motion to Appear Pro Hac Vice. Attorney Darcy A. Paul added. Signed by Judge Arthur J. Schwab on 8/02/07. (smk) (Entered: 08/02/2007)
08/08/2007	46	Pro Hac Vice Fees received in the amount \$ 40 receipt # 5836 re 44 Motion to Appear Pro Hac Vice (brs) (Entered: 08/08/2007)
08/15/2007	47	NOTICE by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC. <i>Joint Proposal for Claim Construction Hearing</i> (Johnson, Daniel) (Entered: 08/15/2007)
08/15/2007	48	NOTICE by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC. <i>Joint Disputed Claim Terms Chart</i> (Attachments: # 1 Appendix Joint Disputed Claim Terms Chart)(Johnson, Daniel) (Entered:

		08/15/2007
08/15/2007	49	EXHIBITS in Support of 48 Notice (Other) by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Appendix 2 # 2 Appendix 3 # 3 Appendix 4 # 4 Appendix 5 # 5 Appendix 6 # 6 Appendix 7A # 7 Appendix 7B # 8 Appendix 8 # 9 Appendix 9 # 10 Appendix 10 # 11 Appendix 11 # 12 Appendix 12 # 13 Appendix 13 # 14 Appendix 14 # 15 Appendix 15 # 16 Appendix 16 # 17 Appendix 17 # 18 Appendix 18 # 19 Appendix 19 # 20 Appendix 20) (Johnson, Daniel) (Entered: 08/15/2007)
08/15/2007	50	NOTICE by UNIVERSITY OF PITTSBURGH <i>Expert Report and Disclosure of Michael C. Schell, Ph.D. Concerning Claim Construction of U.S. Patent Nos. 5,727,554 and 5,784,431</i> (Attachments: # 1 Exhibit Expert Report of Michael C. Schell, Ph.D. Concerning Claim Construction of USPat Nos 5,727,554 and 5,784,431 # 2 Appendix A # 3 Appendix B # 4 Appendix C # 5 Appendix D # 6 Appendix E # 7 Appendix F # 8 Appendix G # 9 Appendix H # 10 Appendix I # 11 Appendix J # 12 Appendix K # 13 Appendix L # 14 Appendix M # 15 Appendix N # 16 Appendix O # 17 Appendix P)(Johnson, Daniel) (Entered: 08/15/2007)
08/15/2007	51	Disclosure of Expert Testimony on Claim Construction by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Exhibit)(Poppe, Matthew) Title modified on 8/16/2007 (sjs). (Entered: 08/15/2007)
08/15/2007	52	Expert Report re 51 Disclosure of Expert Testimony on Claim Construction by VARIAN MEDICAL SYSTEMS, INC. Expert: Dr. Steve B. Jiang, Ph.D.. (Poppe, Matthew) Modified on 8/16/2007 (sjs). (Entered: 08/15/2007)
08/15/2007	53	Disclosure of Testimony on Claim Construction by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit)(Poppe, Matthew) Title modified on 8/16/2007 (sjs). (Entered: 08/15/2007)
08/15/2007	54	Expert Report re 53 Disclosure of Testimony on Claim Construction by VARIAN MEDICAL SYSTEMS, INC. Expert: James M. Balter, Ph.D.. (Poppe, Matthew) Modified on 8/16/2007 (sjs). (Entered: 08/15/2007)
08/16/2007	55	EXHIBITS in Support of 54 Expert Report by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M # 14 Exhibit N # 15 Exhibit O # 16 Exhibit P # 17 Exhibit Q # 18 Exhibit R # 19 Exhibit S # 20 Exhibit T # 21 Exhibit U # 22 Exhibit V # 23 Exhibit W # 24 Exhibit X # 25 Exhibit Y)(Poppe, Matthew) (Entered: 08/16/2007)
08/16/2007	56	EXHIBITS in Support of 52 Expert Report by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Appendix A # 4 Appendix B # 5 Appendix C # 6 Appendix D)(Poppe, Matthew) (Entered: 08/16/2007)

08/16/2007	57	EXHIBITS in Support of 54 Expert Report by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit Z # 2 Exhibit AA)(Poppe, Matthew) (Entered: 08/16/2007)
08/16/2007		ORDER The 47 Joint Proposal for Claim Construction Hearing is referred to the Special Master for review and ruling. Special Master should enter a procedural order relating to said Claim Construction Hearing which he believes would establish the fairest procedure and the one most helpful to the Special Master in reaching his decision on the claim construction issues. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 8/16/07. (smk) (Entered: 08/16/2007)
08/16/2007	58	MOTION to Quash Subpoena Duces Tecum Directed to Non-Party Eckert Seamans Cherin & Mellott, LLC by Defendant Varian Medical Services, Inc. <i>and Objections</i> by ECKERT SEAMANS CHERIN & MELLOTT, LLC. (Attachments: # 1 Exhibit 1 # 2 Proposed Order) (Kenrick, John) (Entered: 08/16/2007)
08/17/2007	59	MOTION for attorney M. Brendan Smith to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit) (Sneath, Henry) (Entered: 08/17/2007)
08/17/2007	60	Errata re 59 MOTION for attorney M. Brendan Smith to Appear Pro Hac Vice by VARIAN MEDICAL SYSTEMS, INC.. Reason for Correction: I forgot to attach the proposed order to the Motion. (Sneath, Henry) (Entered: 08/17/2007)
08/17/2007	61	Pro Hac Vice Fees received in the amount \$40.00, Receipt # 6000, Re 59 Motion for Brendan Smith to Appear Pro Hac Vice. (eca) (Entered: 08/17/2007)
08/21/2007	62	ORDER granting 59 Motion to Appear Pro Hac Vice. Attorney M. Brendan Smith added. Signed by Judge Arthur J. Schwab on 8/21/07. (smk) (Entered: 08/21/2007)
08/23/2007	63	MOTION for attorney Bradford A. Cangro to Appear Pro Hac Vice by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Cangro, Bradford) (Entered: 08/23/2007)
08/23/2007	64	MOTION for attorney John D. Zele to Appear Pro Hac Vice <i>Motion and Affidavit for Admission Pro Hac Vice of John D. Zele</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B)(Zele, John) (Entered: 08/23/2007)
08/23/2007	65	Pro Hac Vice Fees received in the amount \$ 40 receipt # 6084 re 63 Motion to Appear Pro Hac Vice (ept) (Entered: 08/23/2007)
08/23/2007	66	Pro Hac Vice Fees received in the amount \$ 40 receipt # 6086 re 64 Motion to Appear Pro Hac Vice (ept) (Entered: 08/23/2007)
08/28/2007		ORDER granting 63 Motion to Appear Pro Hac Vice and granting 64 Motion to Appear Pro Hac Vice. Attorneys Cangro and Zele added. Text-

		only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 8/28/07. (smk) (Entered: 08/28/2007)
08/30/2007		ORDER REQUIRING RESPONSE to Motion to Quash. Responses due by 9/4/2007 at 4:00 PM. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 8/30/07. (smk) (Entered: 08/30/2007)
09/04/2007	67	BRIEF in Opposition re 58 MOTION to Quash Subpoena Duces Tecum Directed to Non-Party Eckert Seamans Cherin & Mellott, LLC by Defendant Varian Medical Services, Inc. <i>and Objections</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order)(Sneath, Henry) (Entered: 09/04/2007)
09/05/2007	68	MOTION for Discovery <i>for Leave to Take More Than Ten (10) Fact Depositions</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Discovery Dispute Certificate Pursuant to L.R. 37.1 # 2 Proposed Order)(Sneath, Henry) (Entered: 09/05/2007)
09/06/2007		ORDER Response/Briefing Schedule. Response to 68 due by 9/12/2007 by Noon. Signed by Judge Arthur J. Schwab on 9/6/07. (ms) Modified on 9/6/2007 to add that this is a text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter (sjs). (Entered: 09/06/2007)
09/06/2007	69	ORDER granting 58 Motion to Quash. Signed by Judge Arthur J. Schwab on 9/6/07. (ms) (Entered: 09/06/2007)
09/07/2007	70	REPORT of Early Neutral Evaluation Settlement has not been reached. Amount of discovery conducted: Written discovery, two depositions to date. For cases participating in the Court's ADR pilot project, the parties are reminded of their obligation to complete the ADR questionnaire and return same to the Clerk of Court within 5 days of the conclusion of the ADR process. The questionnaire can be accessed at www.pawd.uscourts.gov. Click on the ADR icon. ENE session was held held on 8/29/2007.(Johnson, Daniel) (Entered: 09/07/2007)
09/12/2007	71	RESPONSE to Motion re 68 MOTION for Discovery <i>for Leave to Take More Than Ten (10) Fact Depositions</i> filed by UNIVERSITY OF PITTSBURGH. (Johnson, Daniel) (Entered: 09/12/2007)
09/12/2007		ORDER denying 68 Motion for Discovery. After consideration of defendant's motion for leave to take more than ten (10) fact depositions (doc. no. 68) and plaintiffs response thereto (doc. no. 71), said motion is DENIED, because said motion is premature, and said motion fails to establish a need for more than ten (10) witnesses at this time. Chief trial counsel for the parties, plus Pittsburgh based counsel familiar with this Courts practices and procedures, shall meet face-to-face in Pittsburgh before September 28, 2007 to develop a mutual discovery plan. Signed by Judge Arthur J. Schwab on 9/12/07. Text-only entry; no PDF

		document will issue. This text-only entry constitutes the Courts order or notice on the matter. (ms) (Entered: 09/12/2007)
09/28/2007	72	Emergency MOTION to Compel Defendant to Conduct Depositions in Compliance with Court Orders <i>Plaintiff's</i> , Emergency MOTION for Discovery by UNIVERSITY OF PITTSBURGH. (Johnson, Daniel) (Entered: 09/28/2007)
09/28/2007	73	DECLARATION <i>Declaration of Darcy A. Paul in Support of Plaintiff's Emergency Motion to Compel Defendant to Conduct Depositions in Compliance with Court Orders</i> by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M # 14 Exhibit N # 15 Exhibit O # 16 Exhibit P)(Paul, Darcy) (Entered: 09/28/2007)
09/28/2007	74	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH. (Paul, Darcy) (Entered: 09/28/2007)
10/01/2007		ORDER REQUIRING RESPONSE to 72 Motion to Compel. Responses due by 10/2/2007 at noon. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order or Notice of the Court on the matter. Signed by Judge Arthur J. Schwab on 10/01/07. (smk) (Entered: 10/01/2007)
10/01/2007	75	MOTION for attorney Michael F. Heafey, Esquire to Appear Pro Hac Vice Filing fee \$ 40 Receipt # 699101 by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Affidavit # 2 Proposed Order) (Sneath, Henry) (Entered: 10/01/2007)
10/02/2007	76	Counter MOTION to Compel Plaintiff to Cooperate in Deposition Scheduling by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order # 2 Proposed Order)(Sneath, Henry) (Entered: 10/02/2007)
10/02/2007	77	BRIEF by VARIAN MEDICAL SYSTEMS, INC. in Support of 76 Counter MOTION to Compel Plaintiff to Cooperate in Deposition Scheduling. <i>and in Support of Varian's Opposition to Plaintiff's Emergency Motion</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 10/02/2007)
10/02/2007	78	DECLARATION re 76 Counter MOTION to Compel Plaintiff to Cooperate in Deposition Scheduling, 77 Brief in Support - Other, by VARIAN MEDICAL SYSTEMS, INC. Affiant: Matthew H. Poppe.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M # 14 Exhibit N # 15 Exhibit O # 16 Exhibit P # 17 Exhibit Q # 18 Exhibit R # 19 Exhibit S # 20 Exhibit T # 21 Exhibit U # 22 Exhibit V # 23 Exhibit W # 24 Exhibit X # 25 Exhibit Y # 26 Exhibit Z # 27 Exhibit AA # 28 Exhibit BB # 29 Exhibit CC # 30 Exhibit DD # 31 Exhibit EE # 32 Exhibit FF # 33 Exhibit GG # 34 Exhibit HH)(Sneath, Henry) Modified on 10/2/2007

		(sjs). (Entered: 10/02/2007)
10/02/2007	79	DISCOVERY DISPUTE CERTIFICATE by VARIAN MEDICAL SYSTEMS, INC. re 76 Counter MOTION to Compel Plaintiff to Cooperate in Deposition Scheduling. (Sneath, Henry) (Entered: 10/02/2007)
10/03/2007		ORDER REQUIRING RESPONSE to 76 Motion to Compel. Responses due by 10/5/2007 at NOON. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 10/03/07. (smk) (Entered: 10/03/2007)
10/03/2007	80	ORDER granting 75 Motion to Appear Pro Hac Vice. Attorney Heafey added for defendant. Signed by Judge Arthur J. Schwab on 10/03/07. (smk) (Entered: 10/03/2007)
10/05/2007	81	RESPONSE to Motion re 76 Counter MOTION to Compel Plaintiff to Cooperate in Deposition Scheduling <i>University of Pittsburgh's Response to Defendant's Emergency Counter-Motion to Compel Plaintiff to Cooperate in Deposition Scheduling</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Paul, Darcy) (Entered: 10/05/2007)
10/05/2007	82	DECLARATION <i>Declaration of Darcy A. Paul in Support of Plaintiff's Response to Defendant Varian Medical Systems, Inc.'s Emergency Countermotion to Compel Plaintiff to Cooperate in Deposition Scheduling</i> by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H)(Paul, Darcy) (Entered: 10/05/2007)
10/05/2007	83	ORDER granting in part and denying in part 72 Motion to Compel; granting in part and denying in part 72 Motion for Discovery; granting in part and denying in part 76 Motion to Compel. Signed by Judge Arthur J. Schwab on 10/5/07. (ms) (Entered: 10/05/2007)
10/05/2007	84	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH. (Paul, Darcy) (Entered: 10/05/2007)
10/05/2007	85	MOTION to Compel Production of Witnesses, MOTION for Discovery <i>University of Pittsburgh's Motion to Compel Defendant to Produce Witnesses</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Paul, Darcy) (Entered: 10/05/2007)
10/05/2007	86	DECLARATION <i>Declaration of Darcy A. Paul in Support of University of Pittsburgh's Motion to Compel Defendant to Produce Witnesses</i> by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M)(Paul, Darcy) (Entered: 10/05/2007)

10/09/2007		ORDER Response/Briefing Schedule re 85 Motion to Compel, Motion for Discovery. Responses due by 10/10/2007 at Noon. Text-only entry; no PDF document will issue. This text-only entry constitutes the Courts order or notice on the matter.Signed by Judge Arthur J. Schwab on 10/9/07. (ms) (Entered: 10/09/2007)
10/10/2007	87	BRIEF by VARIAN MEDICAL SYSTEMS, INC. in Opposition to 85 MOTION to Compel Production of Witnesses MOTION for Discovery <i>University of Pittsburgh's Motion to Compel Defendant to Produce Witnesses.</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Affidavit Declaration of Matthew Poppe)(Clougherty, Shannon) (Entered: 10/10/2007)
10/10/2007	88	Joint MOTION for Discovery <i>to Depose Michael Chen and Stanley Mansfield in California Due to Witness Medical Concerns</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 10/10/2007)
10/10/2007		ORDER denying 85 Motion to Compel. After consideration of the Plaintiff's motion and defendant's brief in opposition 87 , said motion is DENIED, without prejudice until all parties have fully completed the discovery schedule re document no. 83 . Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 10/10/07. (smk) (Entered: 10/10/2007)
10/11/2007	89	ORDER granting 88 Emergency Joint Motion to Depose Michael Chen and Stanley Mansfield. Signed by Judge Arthur J. Schwab on 10/11/07. (smk) (Entered: 10/11/2007)
10/12/2007	90	MOTION for Clarification as to 83 Order on Motion to Compel, Order on Motion for Discovery, by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Tautkus, Rita) (Entered: 10/12/2007)
10/12/2007	91	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH re 90 MOTION for Clarification as to 83 Order on Motion to Compel, Order on Motion for Discovery,. (Tautkus, Rita) (Entered: 10/12/2007)
10/12/2007	92	RESPONSE to Motion re 90 MOTION for Clarification as to 83 Order on Motion to Compel, Order on Motion for Discovery, <i>Varian's Response to Plaintiff's "Motion to Clarify Order of Court Re: Deposition Schedule"</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 10/12/2007)
10/15/2007	93	ORDER granting 90 Motion for Clarification. Signed by Judge Arthur J. Schwab on 10/15/07. (smk) (Entered: 10/15/2007)
10/17/2007	94	AFFIDAVIT re 83 Order on Motion to Compel, Order on Motion for Discovery, <i>Affidavit of John D. Zele</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A)(Tautkus, Rita) (Entered: 10/17/2007)

10/19/2007	95	MOTION for Leave to File Excess Pages <i>Plaintiff University of Pittsburgh's Motion to Exceed Page Limit</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Paul, Darcy) (Entered: 10/19/2007)
10/19/2007	96	NOTICE by UNIVERSITY OF PITTSBURGH of <i>Filing of Opening Claim Construction Brief</i> (Tautkus, Rita); ERROR: Wrong event selected. Redocketed as Opening Claim Construction Brief at Doc. # 102 . This document removed from public view. Modified on 10/29/2007. (tt) (Entered: 10/19/2007)
10/19/2007	97	EXHIBITS in Support re: 102 by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit 1 # 2 Exhibit 2 # 3 Exhibit 3 # 4 Exhibit 4 # 5 Exhibit 5 # 6 Exhibit 6 # 7 Exhibit 7 # 8 Exhibit 8 # 9 Exhibit 9 # 10 Exhibit 10)(Tautkus, Rita) Modified on 10/29/2007. (tt) (Entered: 10/19/2007)
10/19/2007	98	EXHIBITS in Support re: 102 by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit 11 # 2 Exhibit 12 # 3 Exhibit 13 # 4 Exhibit 14 # 5 Exhibit 15 # 6 Exhibit 16 # 7 Exhibit 17 # 8 Exhibit 18 # 9 Exhibit 19 # 10 Exhibit 20 # 11 Exhibit 21)(Tautkus, Rita) Modified on 10/29/2007. (tt) (Entered: 10/19/2007)
10/19/2007	99	EXHIBITS in Support re: 102 by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit 22 # 2 Exhibit 23 # 3 Exhibit 24 # 4 Exhibit 25 # 5 Exhibit 26 # 6 Exhibit 27 # 7 Exhibit 28)(Tautkus, Rita) Modified on 10/29/2007. (tt) (Entered: 10/19/2007)
10/19/2007	100	NOTICE by UNIVERSITY OF PITTSBURGH of <i>Extrinsic Evidence</i> (Tautkus, Rita) (Entered: 10/19/2007)
10/19/2007	102	OPENING Claim Construction Brief filed by UNIVERSITY OF PITTSBURGH. "Document previously filed electronically." (tt) (Entered: 10/29/2007)
10/23/2007	101	ORDER granting 95 Motion for Leave to File Excess Pages. Signed by Judge Arthur J. Schwab on 10/22/07. (smk) (Entered: 10/23/2007)
10/29/2007		CLERK'S OFFICE QUALITY CONTROL MESSAGE. ERROR: re 96 Notice (Other); Wrong event selected. CORRECTION: Re-docketed as Opening Claim Construction Brief at doc. # 102 . This message is for informational purposes only. (tt) (Entered: 10/29/2007)
11/01/2007	103	NOTICE by UNIVERSITY OF PITTSBURGH <i>Notice of Plaintiff's Claim Construction Tutorial</i> (Attachments: # 1 Exhibit A # 2 Exhibit B) (Paul, Darcy) (Entered: 11/01/2007)
11/02/2007	104	MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 11/02/2007)
11/02/2007		ORDER granting 104 Motion for Leave to File documents under seal; opposing counsel does not object. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order or Notice of the

		Court on the matter. Signed by Judge Arthur J. Schwab on 11/02/07. (mj1) (Entered: 11/02/2007)
11/02/2007	105	NOTICE by VARIAN MEDICAL SYSTEMS, INC. <i>of Defendant's Certification that Plaintiff Does Not Object to Defendant's Motion for Leave to File Documents Under Seal</i> (Clougherty, Shannon) (Entered: 11/02/2007)
11/02/2007	106	SEALED DOCUMENT by VARIAN MEDICAL SYSTEMS, INC. (sjs) (Entered: 11/02/2007)
11/02/2007	107	NOTICE by VARIAN MEDICAL SYSTEMS, INC. <i>IDENTIFICATION OF EXTRINSIC EVIDENCE</i> (Attachments: # 1 Exhibit 1 # 2 Exhibit 1-A # 3 Exhibit 1-B # 4 Exhibit 1-C # 5 Exhibit 2 # 6 Exhibit 3 # 7 Exhibit 4 # 8 Exhibit 5 # 9 Exhibit 6 # 10 Exhibit 7 # 11 Exhibit 8 # 12 Exhibit 9 # 13 Exhibit 10 # 14 Exhibit 11 # 15 Exhibit 12 # 16 Exhibit 13 # 17 Exhibit 14 # 18 Exhibit 15 # 19 Exhibit 16 # 20 Exhibit 17 # 21 Exhibit 18 # 22 Exhibit 19 # 23 Exhibit 20)(Poppe, Matthew) Modified on 11/5/2007 (sjs). (Entered: 11/02/2007)
11/02/2007	108	OPENING Claim Construction Brief <i>VARIAN MEDICAL SYSTEM, INC.'S CLAIM CONSTRUCTION BRIEF</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 11/02/2007)
11/05/2007	109	MOTION for Leave to File Excess Pages <i>Plaintiff University of Pittsburgh's Motion to Exceed Page Limit for Claim Construction Reply Brief</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Paul, Darcy) (Entered: 11/05/2007)
11/06/2007	110	ORDER granting 109 Motion for Leave to Exceed Page Limit for Claim Construction Reply Brief. Signed by Judge Arthur J. Schwab on 11/06/07. (smk) (Entered: 11/06/2007)
11/09/2007	111	MOTION to Seal <i>Plaintiff University of Pittsburgh's Motion for Leave of Court to File Document Under Seal</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order)(Paul, Darcy) (Entered: 11/09/2007)
11/09/2007	112	NOTICE by UNIVERSITY OF PITTSBURGH <i>Plaintiff's Certification That Defendant Does Not Object to Plaintiffs Motion For Leave to File Document Under Seal</i> (Paul, Darcy) (Entered: 11/09/2007)
11/09/2007	113	REPLY CLAIM CONSTRUCTION BRIEF re 108 Opening Claim Construction Brief, filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibits 1-5)(Tautkus, Rita) Modified on 11/13/2007 to add document linkage (sjs). (Entered: 11/09/2007)
11/13/2007		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 113 Reply Brief. ERROR: Document incorrectly linked or no linkage was provided. CORRECTION: Linked to appropriate document. This message is for informational purposes only. (sjs) (Entered: 11/13/2007)
11/13/2007	114	Proposed Order <i>Re: Procedures for Claim Construction Hearing</i> by UNIVERSITY OF PITTSBURGH, VARIAN MEDICAL SYSTEMS,

		INC.. (Clougherty, Shannon) (Entered: 11/13/2007)
11/13/2007	115	ORDER granting 111 Motion for Leave to File Document Under Seal. Signed by Judge Arthur J. Schwab on 11/13/07. (smk) (Entered: 11/13/2007)
11/14/2007	116	SEALED DOCUMENT (Exhibit A) by UNIVERSITY OF PITTSBURGH. (sjs) (Entered: 11/14/2007)
11/15/2007	117	NOTICE by VARIAN MEDICAL SYSTEMS, INC. of <i>Filing of CD Tutorial</i> (Clougherty, Shannon) (Entered: 11/15/2007)
11/15/2007	118	NOTICE by VARIAN MEDICAL SYSTEMS, INC. re 117 Notice (Other) <i>VARIAN'S TUTORIAL (PART 1)</i> (Poppe, Matthew) (Entered: 11/15/2007)
11/15/2007	119	NOTICE by VARIAN MEDICAL SYSTEMS, INC. re 118 Notice (Other) <i>VARIAN'S TUTORIAL (PART 2)</i> (Poppe, Matthew) (Entered: 11/15/2007)
11/16/2007		Remark: CD of Varian Claim Construction Tutorial received by the Clerk's Office and forwarded to Judge (jv) (Entered: 11/16/2007)
11/20/2007	120	Emergency MOTION to Strike 117 Notice (Other), 119 Notice (Other), Remark, 118 Notice (Other) <i>Plaintiff University of Pittsburgh's Emergency Motion to Strike Defendant's Tutorial</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 11/20/2007)
11/20/2007	121	NOTICE by UNIVERSITY OF PITTSBURGH re 120 Emergency MOTION to Strike 117 Notice (Other), 119 Notice (Other), Remark, 118 Notice (Other) <i>Plaintiff University of Pittsburgh's Emergency Motion to Strike Defendant's Tutorial</i> Emergency MOTION to Strike 117 Notice (Other), 119 Notice (Other), Remark, 118 Notice (Other) <i>Plaintiff University of Pittsburgh's Emergency Motion to Strike Defendant's Tutorial DISPUTE CERTIFICATE</i> (Paul, Darcy) (Entered: 11/20/2007)
11/21/2007	122	ORDER REQUIRING RESPONSE to 120 Motion to Strike. Response to Motion due by 11/29/2007 at Noon. Signed by Judge Arthur J. Schwab on 11/21/07. (eca) (Entered: 11/21/2007)
11/21/2007	123	Unopposed MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 11/21/2007)
11/21/2007	124	ORDER granting 123 Motion for Leave to File Documents under Seal. Signed by Judge Arthur J. Schwab on 11/21/07. (eca) (Entered: 11/21/2007)
11/21/2007	125	Emergency MOTION for Clarification as to 122 Response/Briefing Schedule <i>Emergency Motion to Clarify Order of Court Requiring Response to Motion to Strike</i> by UNIVERSITY OF PITTSBURGH. (Tautkus, Rita) (Entered: 11/21/2007)

11/21/2007	126	Unopposed MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order Granting Defendant's Motion for Leave to File Documents Under Seal) (Liu, Zheng) (Entered: 11/21/2007)
11/21/2007	127	SEALED MOTION by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Proposed Order) (jv) Modified on 11/26/2007 to correct file date. (crw) (Entered: 11/23/2007)
11/21/2007	128	SEALED DOCUMENT in Support of 127 Sealed Motion by VARIAN MEDICAL SYSTEMS, INC. (jv) Modified on 11/26/2007 to correct file date. (crw) (Entered: 11/23/2007)
11/21/2007	129	SEALED DOCUMENT in Support of 127 Sealed Motion SYSTEMS, INC. (jv) Modified on 11/26/2007 to reflect correct file date. (crw) Modified on 11/26/2007 to correct file date. (crw) (Entered: 11/23/2007)
11/21/2007	130	SEALED DOCUMENT in Support of 127 Sealed Motion by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Exhibit A # Exhibit B # Exhibit C # Exhibit D # Exhibit E # Exhibit F # Exhibit G # Exhibit H # Exhibit I # Exhibit I (Cont.) # Exhibit J # Exhibit K # Exhibit L # Exhibit M # Exhibit N # Exhibit O # Exhibit P # Exhibit Q # Exhibit R # Exhibit S # Exhibit T # Exhibit W # Exhibit X # Exhibit Y # Exhibit Z # Exhibit AA # Exhibit BB # Exhibit CC # Exhibit DD # Envelope GG # Exhibit U # Exhibit V # Exhibit EE # Exhibit FF) (jv) Modified on 11/26/2007 to correct file date. (crw) (Entered: 11/23/2007)
11/26/2007		TEXT ORDER denying 125 Motion for Clarification. Signed by Judge Arthur J. Schwab on 11/26/07. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (smk) (Entered: 11/26/2007)
11/26/2007	131	ORDER granting 126 Motion for Leave to File Documents Under Seal. Signed by Judge Arthur J. Schwab on 11/26/07. (smk) (Entered: 11/26/2007)
11/26/2007	132	ORDER re 127 SEALED MOTION filed by VARIAN MEDICAL SYSTEMS, INC. Response to Motion due by 12/5/2007. Signed by Judge Arthur J. Schwab on 11/26/07. (smk) (Entered: 11/26/2007)
11/26/2007		TEXT ORDER: The Special Master shall rule on 120 Emergency Motion to Strike Defendant's Tutorial and 127 Sealed Motion by Varian Medical Systems, Inc. (re: Motion for Summary Judgment). Signed by Judge Arthur J. Schwab on 11/26/07. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (smk) (Entered: 11/26/2007)
11/26/2007	133	Unopposed MOTION To Identify Additional Extrinsic Evidence (<i>Emergency Motion</i>) by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 11/26/2007)
11/26/2007	134	SEALED DOCUMENT (Transcript Excerpt 37:15-53:4) re: 131 Order

		by VARIAN MEDICAL SYSTEMS, INC. (jsp) (Entered: 11/27/2007)
11/26/2007	135	SEALED DOCUMENT (Transcript Excerpt 92:4-135:2) re: 131 Order by VARIAN MEDICAL SYSTEMS, INC. (jsp) (Entered: 11/27/2007)
11/26/2007	136	SEALED DOCUMENT (Transcript Excerpt 161:7-169:3) re: 131 Order by VARIAN MEDICAL SYSTEMS, INC. (jsp) Modified on 11/28/2007. (tt) (Entered: 11/27/2007)
11/26/2007	137	SEALED DOCUMENT (Transcript Excerpt 202:11-238:21) re: 131 Order by VARIAN MEDICAL SYSTEMS, INC. (jsp) (Entered: 11/27/2007)
11/27/2007	138	ORDER granting 133 Motion Identify Additional Extrinsic Evidence as follows: Defendant may add excerpts listed in paragraph 8 of its unopposed motion of the Charalambos Athanassiou deposition transcript as extrinsic evidence for the Claim Construction Hearing 11/29/07. Signed by Judge Arthur J. Schwab on 11/27/07. (eca) (Entered: 11/27/2007)
11/28/2007	139	NOTICE by UNIVERSITY OF PITTSBURGH <i>Dispute Certificate</i> (Paul, Darcy) (Entered: 11/28/2007)
11/28/2007	140	MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 11/28/2007)
11/28/2007	141	NOTICE by UNIVERSITY OF PITTSBURGH re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> , 139 Notice (Other) <i>Dispute Certificate</i> (Paul, Darcy) (Entered: 11/28/2007)
11/28/2007	142	Emergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY OF PITTSBURGH <i>Plaintiff University of Pittsburgh's Emergency Motion to Identify Additional Extrinsic Evidence</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 11/28/2007)
11/28/2007	143	DECLARATION re 142 Emergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY OEmergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY O Declaration of Darcy A. Paul in Support of Plaintiff <i>University of Pittsburgh's Emergency Motion to Identify Additional Extrinsic Evidence</i> by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul.. (Attachments: # 1 Exhibit A # 2 Exhibit B) (Paul, Darcy) (Entered: 11/28/2007)

11/29/2007		ORDER REQUIRING RESPONSE TO MOTIONS: 140 Motion to Seal and 142 Motion to Seal responses due by 11/29/2007 at 02:00 PM. Signed by Judge Arthur J. Schwab on 11/29/07. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 11/29/2007)
11/29/2007	144	RESPONSE to Motion re 120 Emergency MOTION to Strike 117 Notice (Other), 119 Notice (Other), Remark, 118 Notice (Other) <i>Plaintiff University of Pittsburgh's Emergency Motion to Strike Defendant's Tutorial</i> Emergency MOTION to Strike 117 Notice (Other), 119 Notice (Other), Remark, 118 Notice (Other) <i>Plaintiff University of Pittsburgh's Emergency Motion to Strike Defendant's Tutorial</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 11/29/2007)
11/29/2007	145	RESPONSE to Motion re 142 Emergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY OEmergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY O filed by VARIAN MEDICAL SYSTEMS, INC.. (Clougherty, Shannon) (Entered: 11/29/2007)
11/29/2007	146	RESPONSE to Motion re 142 Emergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY OEmergency MOTION re 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by UNIVERSITY OF PITTSBURGH, 141 Notice (Other) filed by UNIVERSITY OF PITTSBURGH, 139 Notice (Other) filed by UNIVERSITY O, 140 MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Clougherty, Shannon) (Entered: 11/29/2007)
11/29/2007	147	ORDER granting 140 Plaintiff's Motion for Leave of Court to File Documents Under Seal. Signed by Judge Arthur J. Schwab on 11/29/07. (eca) (Entered: 11/29/2007)
11/29/2007	148	ORDER denying 142 Plaintiff's Emergency Motion to Identify Additional Extrinsic Evidence. Signed by Judge Arthur J. Schwab on 11/29/07. (eca) (Entered: 11/29/2007)
12/05/2007	149	MOTION for Joinder <i>Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 12/05/2007)
12/05/2007	150	DECLARATION re 149 MOTION for Joinder <i>Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to</i>

		<i>Join Carnegie Mellon University Declaration of Darcy A. Paul in Support of Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul..</i> (Attachments: # 1 Exhibit A (Confidential) # 2 Exhibit B (Confidential) # 3 Exhibit C (Confidential) # 4 Exhibit D) (Paul, Darcy) (Entered: 12/05/2007)
12/05/2007	151	MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 12/05/2007)
12/05/2007	152	MOTION to Seal <i>Plaintiff's Motion for Leave of Court to File Documents Under Seal</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 12/05/2007)
12/05/2007	153	BRIEF in Opposition re 127 SEALED MOTION <i>Redacted Plaintiff University of Pittsburgh's Opposition to Defendant Varian Medical Systems, Inc.'s Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 12/05/2007)
12/05/2007	154	DECLARATION re 153 Brief in Opposition to Motion, <i>Declaration of Darcy A. Paul in Support of Plaintiff University of Pittsburgh's Opposition to Defendant Varian Medical Systems Inc.'s Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing</i> by UNIVERSITY OF PITTSBURGH Affiant: Darcy A. Paul.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F) (Paul, Darcy) (Entered: 12/05/2007)
12/06/2007	155	ORDER REQUIRING RESPONSE to 149 Motion for Joinder. Response due by 12/12/2007 at NOON. Signed by Judge Arthur J. Schwab on 12/06/07. (eca) (Entered: 12/06/2007)
12/06/2007	156	ORDER granting 151 Motion for leave of Court to file documents under seal. It is hereby ORDERED that confidential exhibits A - C of UPitt's Motion to Join CMU shall be filed under seal. Signed by Judge Arthur J. Schwab on 12/06/07. (eca) (Entered: 12/06/2007)
12/06/2007	157	ORDER granting 152 Motion for leave of Court to file documents under seal. The following documents shall be SEALED: UPitt's Opposition to Defendant's Motion for SJ for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue Standing, Confidential and/or Attorney Eyes Only Exhibits to UPitt's Opposition, and UPitt's Responsive Statement of Material Disputed and Additional Facts in Support of its Opposition. Signed by Judge Arthur J. Schwab on 12/06/07. (eca) (Entered: 12/06/2007)
12/06/2007	158	SEALED DOCUMENT Exhibits A-C of UPitt's Motion to Join CMU by UNIVERSITY OF PITTSBURGH (ept) (Entered: 12/06/2007)

12/06/2007	159	SEALED DOCUMENT UPitt's Opposition to Defendant's Motion for SJ for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue Standing by UNIVERSITY OF PITTSBURGH. (ept) (Entered: 12/06/2007)
12/06/2007	160	SEALED DOCUMENT Confidential and/or Attorney Eyes Only Exhibits A-F to UPitt's Opposition by UNIVERSITY OF PITTSBURGH (ept) (Entered: 12/06/2007)
12/06/2007	161	SEALED DOCUMENT UPitt's Responsive Statement of Material Disputed and Additional Facts in Support of its Opposition by UNIVERSITY OF PITTSBURGH. (ept) (Entered: 12/06/2007)
12/12/2007	162	RESPONSE to Motion re 149 MOTION for Joinder <i>Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Sneath, Henry) (Entered: 12/12/2007)
12/12/2007	163	EXHIBITS A - F in Support of 162 Response to Motion, by VARIAN MEDICAL SYSTEMS, INC.. (Sneath, Henry) (Entered: 12/12/2007)
12/12/2007	164	MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 12/12/2007)
12/13/2007	165	ORDER granting 164 Motion for Leave to File Documents under Seal. The following documents shall be filed under seal: (1) Varian's Motion for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing and (2) Varian's Response to Plaintiff University of Pittsburgh's Responsive Statement of Material Disputed and Additional Facts in Support of Opposition to Defendant Varian Medical Systems, Inc's Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing. Signed by Judge Arthur J. Schwab on 12/13/07. (eca) (Entered: 12/13/2007)
12/13/2007	166	SEALED MOTION for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing by VARIAN MEDICAL SYSTEMS, INC. (Attachment # Reply Memorandum in Support of Summary Judgment Attachment # Proposed Order) added on 12/14/2007 (ept) (Entered: 12/13/2007)
12/13/2007	167	SEALED DOCUMENT Response to "Plaintiff University of Pittsburgh's Responsive Statement of Material Disputed and Additional Facts in Support of Opposition to Defendant Varian Medical Systems, Inc.'s Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing" by VARIAN MEDICAL SYSTEMS, INC. (ept) (Entered: 12/13/2007)
12/14/2007	168	ORDER denying 149 Motion for Joinder. Signed by Judge Arthur J.

		Schwab on 12/14/07. (ms) (Entered: 12/14/2007)
12/14/2007		TEXT ORDER denying 166 Sealed Motion for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing without prejudice for failure to attach a proposed order. Signed by Judge Arthur J. Schwab on 12/14/07. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 12/14/2007)
12/14/2007	169	SEALED MOTION for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Proposed Order # Reply Memorandum in Support of Motion for Summary Judgment) (ept) (Entered: 12/14/2007)
12/14/2007	170	DECLARATION of <i>Shannon M. Clougherty Regarding the Filing of Varian's Motion for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing</i> by VARIAN MEDICAL SYSTEMS, INC.. (Clougherty, Shannon) (Entered: 12/14/2007)
12/17/2007	171	ORDER granting 169 SEALED MOTION for Leave to File Reply Memorandum in Support of its Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing by VARIAN MEDICAL SYSTEMS, INC. Varian shall file its Reply Memorandum in the form attached as Exhibit 1 to the Motion on or before Noon of December 18, 2007. Signed by Judge Arthur J. Schwab on 12/17/07. (eca) (Entered: 12/17/2007)
12/17/2007	172	SEALED DOCUMENT Reply Memorandum in Support of Motion for Summary Judgment by VARIAN MEDICAL SYSTEMS, INC. (ept) (Entered: 12/17/2007)
12/19/2007	173	AMENDED DOCUMENT by VARIAN MEDICAL SYSTEMS, INC.. Amendment to 172 Sealed Document (<i>Amended Certificate of Service</i>). (Clougherty, Shannon) (Entered: 12/19/2007)
01/17/2008	174	Unopposed MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC. (Liu, Zheng) Modified on 1/18/2008 (ept). (Entered: 01/17/2008)
01/17/2008	175	MOTION to Seal <i>Defendant's Certification that Opposing Parties Do Not Object to Defendant's Motion for Leave to File Documents Under Seal</i> by VARIAN MEDICAL SYSTEMS, INC. (Liu, Zheng). This document terminated and removed from public view. It was redocketed at 177 . Modified on 1/18/2008 (ept). (Entered: 01/17/2008)
01/17/2008	176	Proposed Order re 174 MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC. (Liu, Zheng) Modified on 1/18/2008 (ept). (Entered: 01/17/2008)

01/18/2008	177	NOTICE of Defendant's Certification that Opposing Parties do not Object to Motion for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC. re 174 MOTION for Leave to File Documents Under Seal. (ept) (Entered: 01/18/2008)
01/18/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 175 MOTION to Seal <i>Defendant's Certification that Opposing Parties Do Not Object to Defendant's Motion for Leave to File Documents Under Seal</i> . ERROR: Wrong event selected. CORRECTION: Re-docketed as NOTICE of Defendant's Certification that Opposing Parties do not Object to Defendant's Motion for Leave to File Documents Under Seal. This message is for informational purposes only. (ept) (Entered: 01/18/2008)
01/18/2008	178	ORDER granting 174 Motion for Leave to File Documents Under Seal. Signed by Judge Arthur J. Schwab on 01/18/08. (eca) (Entered: 01/18/2008)
01/18/2008	179	Unopposed Supplemental MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Liu, Zheng) Modified on 1/22/2008 (ept). (Entered: 01/18/2008)
01/18/2008	180	NOTICE of <i>Defendant's Certification that Opposing Parties Do Not Object to Defendant's Supplemental Motion For Leave to File Documents Under Seal</i> by VARIAN MEDICAL SYSTEMS, INC. re 179 MOTION to Seal <i>Unopposed</i> Supplemental MOTION for Leave to File Documents Under Seal (Liu, Zheng) (Entered: 01/18/2008)
01/22/2008	181	ORDER granting 179 Motion for Leave to File Documents under Seal. Signed by Judge Arthur J. Schwab on 01/20/08. (eca) (Entered: 01/22/2008)
01/22/2008	182	DECLARATION of <i>Zheng Liu in Support of Motion to Compel Production of Documents in Response to Varian's Second Request for Production of Documents and Document Subpoenas</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit C # 2 Exhibit D # 3 Exhibit E # 4 Exhibit J # 5 Exhibit K # 6 Exhibit L # 7 Exhibit M # 8 Exhibit N # 9 Exhibit O # 10 Exhibit P # 11 Exhibit Q # 12 Exhibit R # 13 Exhibit S # 14 Exhibit T # 15 Exhibit U # 16 Exhibit V # 17 Exhibit W # 18 Exhibit X # 19 Exhibit Y # 20 Exhibit Z # 21 Exhibit AA # 22 Exhibit BB # 23 Exhibit CC # 24 Exhibit DD # 25 Exhibit EE # 26 Exhibit FF # 27 Exhibit GG # 28 Exhibit HH # 29 Exhibit II # 30 Exhibit JJ) (Liu, Zheng) (Entered: 01/22/2008)
01/22/2008	183	MOTION to Compel Dr. Andre Kalend to Re-Produce Documents in an Intelligible Manner by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Liu, Zheng) (Entered: 01/22/2008)
01/22/2008	184	NOTICE <i>Discovery Dispute Certificate Pursuant to L.R. 37.1</i> by VARIAN MEDICAL SYSTEMS, INC. re 183 MOTION to Compel Dr. Andre Kalend to Re-Produce Documents in an Intelligible Manner (Liu, Zheng). This document removed from public view and redocketed at 189 Modified on 1/23/2008 (ept). (Entered: 01/22/2008)

01/22/2008	185	DECLARATION re 183 MOTION to Compel Dr. Andre Kalend to Re-Produce Documents in an Intelligible Manner, 184 Notice (Other) of <i>Zheng Liu in Support of Varian Medical Systems, Inc.'s Motion to Compel Dr. Andre Kalend to Reproduce Documents in an Intelligible Manner</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit C # 3 Exhibit D # 4 Exhibit E # 5 Exhibit F # 6 Exhibit J # 7 Exhibit K # 8 Exhibit L # 9 Exhibit M # 10 Exhibit N # 11 Exhibit O # 12 Exhibit P # 13 Exhibit Q # 14 Exhibit R) (Liu, Zheng) (Entered: 01/22/2008)
01/22/2008	186	MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Liu, Zheng) (Entered: 01/22/2008)
01/22/2008	187	NOTICE <i>Discovery Dispute Certificate Pursuant to L.R. 37.1</i> by VARIAN MEDICAL SYSTEMS, INC. re 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions (Liu, Zheng). This document removed from public view and redocketed at 190 . Modified on 1/23/2008 (ept) (Entered: 01/22/2008)
01/22/2008	188	DECLARATION re 187 Notice (Other), Notice (Other), 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions of <i>Zheng Liu in Support of Varian's Motion to Compel Additional Deposition Time From Certain Witnesses</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M # 14 Exhibit O # 15 Exhibit P # 16 Exhibit Q # 17 Exhibit R # 18 Exhibit S # 19 Exhibit T # 20 Exhibit U # 21 Exhibit V # 22 Exhibit EE # 23 Exhibit FF # 24 Exhibit GG # 25 Exhibit HH # 26 Exhibit II # Exhibit LL # 28 Exhibit NN # 29 Exhibit OO # 30 Exhibit PP # 31 Exhibit QQ # 32 Exhibit RR # 33 Exhibit SS # 34 Exhibit TT # 35 Exhibit UU # 36 Exhibit VV # 37 Exhibit WW # 38 Exhibit XX) (Liu, Zheng) (Entered: 01/22/2008)
01/22/2008	192	SEALED MOTION to Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas (192 Motion) by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # Proposed Order # Exhibit A # Exhibit B # Exhibit F # Exhibit G # Exhibit H # Exhibit I) (ept) (Entered: 01/23/2008)
01/22/2008	193	SEALED DOCUMENT - Exhibits in Support of 186 by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Exhibit N # Exhibit W # Exhibit X # Exhibit Y # Exhibit Z # Exhibit AA # Exhibit BB # Exhibit CC # Exhibit DD # Exhibit JJ # Exhibit KK # Exhibit MM) (ept) Modified on 1/23/2008 to correct document linkage (ept). (Entered: 01/23/2008)

01/22/2008	194	SEALED DOCUMENT - Exhibits in support of 185 by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Exhibit B # Exhibit G # Exhibit H # Exhibit I # Exhibit S # Exhibit T # Exhibit F) (ept) (Entered: 01/23/2008)
01/23/2008	189	DISCOVERY DISPUTE CERTIFICATE by VARIAN MEDICAL SYSTEMS, INC. re 183 MOTION to Compel Dr. Andre Kalend to Re- Produce Documents in an Intelligible Manner. (ept) (Entered: 01/23/2008)
01/23/2008	190	DISCOVERY DISPUTE CERTIFICATE by VARIAN MEDICAL SYSTEMS, INC. re 186 MOTION to Compel Additional Deposition Time. (ept) (Entered: 01/23/2008)
01/23/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 187 Notice (Other), Notice (Other), 184 Notice (Other). ERROR: Wrong event selected. CORRECTION: Re-docketed as Discovery Dispute Certificates. This message is for informational purposes only. (ept) (Entered: 01/23/2008)
01/23/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 188 Declaration, 182 Declaration, 185 Declaration. ERROR: Typed name omitted by s/. CORRECTION: Attorney advised of signature requirements. Attorney to resubmit with signature, using Errata event. This message is for informational purposes only. (ept) (Entered: 01/23/2008)
01/23/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions. ERROR: Signature on document and filer do not match. CORRECTION: Attorney advised of signature requirements. Attorney to resubmit the document using the Errata event. This message is for informational purposes only. (ept) (Entered: 01/23/2008)
01/23/2008		ORDER REQUIRING RESPONSE to 186 Motion to Compel. Response to Motion due by 1/28/2008 at NOON. Signed by Judge Arthur J. Schwab on 01/23/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 01/23/2008)
01/23/2008	191	Errata re 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions by VARIAN MEDICAL SYSTEMS, INC.. Reason for Correction: Signature on document and filer did not match. (Liu, Zheng) (Entered: 01/23/2008)
01/23/2008	195	Errata re 182 Declaration, by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Incomplete signature. (Liu, Zheng) (Entered: 01/23/2008)
01/23/2008	196	Errata re 185 Declaration, by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Incomplete signature. (Liu, Zheng) (Entered:

		01/23/2008)
01/23/2008	197	Errata re 188 Declaration, by VARIAN MEDICAL SYSTEMS, INC. Reason for Correction: Incomplete signature. (Liu, Zheng) (Entered: 01/23/2008)
01/23/2008	198	Ex Parte MOTION to Strike 188 Declaration, 197 Errata by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Proposed Order) (Tautkus, Rita) (Entered: 01/23/2008)
01/24/2008		ORDER REQUIRING RESPONSE to 183 Motion to Compel. Response to Motion due by 1/28/2008. Signed by Judge Arthur J. Schwab on 01/24/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 01/24/2008)
01/24/2008		ORDER REQUIRING RESPONSE to 192 Sealed Motion and 198 Motion to Strike. Responses to Motions due by 1/28/2008 at NOON. Signed by Judge Arthur J. Schwab on 01/24/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 01/24/2008)
01/24/2008	199	RESPONSE to Motion re 198 Ex Parte MOTION to Strike 188 Declaration, 197 Errata filed by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) Modified on 1/25/2008 to name attachment (ept). (Entered: 01/24/2008)
01/25/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 199 Response to Motion. ERROR: Attachment not described correctly or no description was provided. CORRECTION: Attachment description corrected. This message is for informational purposes only. (ept) (Entered: 01/25/2008)
01/27/2008	200	MOTION for Leave of Court to File document under seal by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) Modified on 1/28/2008 (ept). (Entered: 01/27/2008)
01/27/2008	201	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH re 200 MOTION for Leave to File <i>PLAINTIFF UNIVERSITY OF PITTSBURGH'S MOTION FOR LEAVE OF COURT TO FILE DOCUMENT UNDER SEAL.</i> (Tautkus, Rita). This document removed from public view and redocketed at 210 Modified on 1/28/2008 (ept). (Entered: 01/27/2008)
01/27/2008	202	Dr. Andre Kalend's Opposed MOTION for Leave of Court to File Document Under Seal by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) Modified on 1/28/2008 (ept). (Entered: 01/27/2008)
01/27/2008	203	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH re 202 Dr. Andre Kalend's Opposed MOTION for Leave of Court to File Document Under Seal (Tautkus, Rita). Modified on 1/28/2008 (ept). (Entered: 01/27/2008)
01/28/2008	204	BRIEF in Opposition re 183 MOTION to Compel Dr. Andre Kalend to

		Re-Produce Documents in an Intelligible Manner <i>NON-PARTY DR. ANDRE KALEND'S OPPOSITION TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S MOTION TO COMPEL DR. ANDRE KALEND TO RE-PRODUCE DOCUMENTS IN AN INTELLIGIBLE MANNER</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 01/28/2008)
01/28/2008	205	DECLARATION re 204 Brief in Opposition to Motion, <i>DECLARATION OF RITA E. TAUTKUS IN SUPPORT OF PLAINTIFF'S OPPOSITION TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S MOTION TO COMPEL DR. ANDRE KALEND TO RE-PRODUCE DOCUMENTS IN AN INTELLIGIBLE MANNER</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A) (Tautkus, Rita) (Entered: 01/28/2008)
01/28/2008	206	MOTION for Leave to File <i>PLAINTIFF UNIVERSITY OF PITTSBURGH'S OPPOSED MOTION FOR LEAVE OF COURT TO FILE DOCUMENTS UNDER SEAL</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 01/28/2008)
01/28/2008	207	DISCOVERY DISPUTE CERTIFICATE by UNIVERSITY OF PITTSBURGH re 206 MOTION for Leave to File <i>PLAINTIFF UNIVERSITY OF PITTSBURGH'S OPPOSED MOTION FOR LEAVE OF COURT TO FILE DOCUMENTS UNDER SEAL</i> . (Tautkus, Rita) (Entered: 01/28/2008)
01/28/2008	208	BRIEF in Opposition re 192 SEALED MOTION to <i>Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas (' 192 Motion)</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) Modified on 1/29/2008. (ept) (Entered: 01/28/2008)
01/28/2008	209	DECLARATION of Rita E. Tautkus in Support of 208 Plaintiff's Opposition to Defendant Varian Medical Systems, Inc.'s Motion to Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas (' 192 Motion) by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D) (Tautkus, Rita) Modified on 1/29/2008 to add document linkage. (ept) (Entered: 01/28/2008)
01/28/2008	210	NOTICE of Plaintiff's Certification that Defendant does not object to Plaintiff's Motion for Leave to File Document Under Seal by UNIVERSITY OF PITTSBURGH re 200 MOTION for Leave of Court to File Document Under Seal. (ept) (Entered: 01/28/2008)
01/28/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 201 Discovery Dispute Certificate. ERROR: Wrong event selected. CORRECTION: Re-docketed as Plaintiff's Certification that Defendant does not object to Plaintiff's Motion for Leave to File Document Under Seal at 210 . This message is for informational purposes only. (ept) (Entered: 01/28/2008)
01/28/2008	211	Redacted BRIEF in Opposition re 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document

		Production and Improper Instructions Not to Answer Questions filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) Modified on 1/28/2008 (ept). Modified on 1/29/2008 (ept). (Entered: 01/28/2008)
01/28/2008	212	DECLARATION of Rita E. Tautkus in Support of 211 Plaintiff's Opposition to Defendant Varian Medical Systems, Inc.'s Motion to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L # 13 Exhibit M # 14 Exhibit N) (Tautkus, Rita) Modified on 1/29/2008 to add document linkage (ept). (Entered: 01/28/2008)
01/28/2008	213	BRIEF in Opposition re 192 SEALED MOTION, 186 MOTION to Compel Additional Deposition Time from Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions filed by ECKERT SEAMANS CHERIN & MELLOTT, LLC. (Kenrick, John) (Entered: 01/28/2008)
01/28/2008	214	ORDER granting 202 Motion for Leave of Court to File Document Under Seal. Signed by Judge Arthur J. Schwab on 1/28/08. (ms) (Entered: 01/28/2008)
01/28/2008	215	ORDER granting 200 Motion for Leave of Court to File Document Under Seal. Signed by Judge Arthur J. Schwab on 1/28/08. (ms) (Entered: 01/28/2008)
01/28/2008	216	SEALED DOCUMENT - Exhibit A to 205 Declaration by UNIVERSITY OF PITTSBURGH (ept) (Entered: 01/28/2008)
01/28/2008	217	SEALED DOCUMENT - Exhibit N to 212 Declaration by UNIVERSITY OF PITTSBURGH (ept) (Entered: 01/28/2008)
01/29/2008	218	ORDER granting 206 Motion for Leave to File Documents under Seal. The following documents shall be filed under seal on or before NOON of 01/29/08: Excerpts from the deposition transcript of Dr. Kalend, Excerpts from the deposition transcript of Dr. Greenberger dated 09/21/07 and 10/24/07, and an Unredacted version of University of Pittsburgh's Opposition to Defendant's Motion to Compel, including exhibits i, ii, and iii. Signed by Judge Arthur J. Schwab on 01/29/08. (eca) (Entered: 01/29/2008)
01/29/2008	219	ORDER denying 198 Motion to Strike Declaration of Zheng Liu in Support of Varian's Motion to Compel Additional Deposition Time from Certain Witnesses. It is further ORDERED that Exhibit LL to Liu's Declaration in Support of Varian's Motion to Compel Additional Deposition Time from Certain Witnesses filed at Document Nos. 188 and 197 shall be SEALED by the Clerk. Signed by Judge Arthur J. Schwab on 01/29/08. (eca) (Entered: 01/29/2008)

01/29/2008	220	MOTION for Leave to File Reply In Support of 183 Motion to Compel Dr. Andre Kalend To Re-Produce Documents in an Intelligible Manner by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Exhibit Reply # 2 Proposed Order) (Clougherty, Shannon) Modified on 1/30/2008 to add document linkage (ept). (Entered: 01/29/2008)
01/29/2008	221	SEALED DOCUMENT - Plaintiff's Opposition to Defendant Varian Medical Systems, Inc.'s 186 Motion to Compel Additional Deposition Time From Certain Witnesses Based on Late Document Production and Improper Instructions Not to Answer Questions by UNIVERSITY OF PITTSBURGH (Attachments: # Exhibit A # Exhibit G # Exhibit I # Exhibit K # Exhibit L # Exhibit M) (ept) (Entered: 01/29/2008)
01/29/2008	222	MOTION for Leave to File Reply in Support of Motion to Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas (192 Motion) by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit Reply # 2 Proposed Order) (Clougherty, Shannon) (Entered: 01/29/2008)
01/30/2008	223	ORDER granting in part and denying in part 186 Motion to Compel Additional Deposition Time from Certain Witnesses. Counsel for Plaintiff are ORDERED to work with Defense Counsel so the depositions will be completed by 02/15/08. Signed by Judge Arthur J. Schwab on 01/29/08. (eca) (Entered: 01/30/2008)
01/30/2008	224	ORDER granting 183 Motion to Compel Dr. Kalend to Reproduce Documents in an Intelligible Manner. Dr. Kalend shall organize and reproduce his documents and Counsel for Dr. Kalend shall provide the reorganized documents to Counsel for Varian for inspection on or before 02/04/08, in Pittsburgh, PA. Signed by Judge Arthur J. Schwab on 01/29/08. (eca) (Entered: 01/30/2008)
01/30/2008	225	ORDER denying 192 Motion to Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas as untimely and seeking irrelevant documents/material/information. Signed by Judge Arthur J. Schwab on 01/29/08. (eca) (Entered: 01/30/2008)
01/30/2008		ORDER denying 220 Motion for Leave to File Reply in Support of Motion to Compel Dr. Kalend to Reproduce Documents in an Intelligible Manner; denying 222 Motion for Leave to File Reply in Support of Motion to Compel Production of Documents Responsive to Varian's Second Request for Production of Documents and Document Subpoenas. Signed by Judge Arthur J. Schwab on 01/30/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 01/30/2008)
01/31/2008	226	MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 01/31/2008)
01/31/2008	227	ORDER granting 226 Motion for Leave to File Documents Under Seal. Memorandum in Support of Defendant Varian Medical Systems, Inc's

		Motion to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents and for Sanctions, Motion to Compel Non-Parties to Produce Documents, Pages 258-261 from transcripts of depositions of Dr. Greenberger, and pages 7-10 and 24-29 from the transcript of the deposition of Al Ciocca shall be filed under seal. Signed by Judge Arthur J. Schwab on 01/31/08. (eca) (Entered: 01/31/2008)
01/31/2008	228	MOTION to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents (<i>1 Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and 2 Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents</i>) by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Poppe, Matthew) Modified on 2/1/2008 to correctly name attachment (ept). (Entered: 01/31/2008)
01/31/2008	229	Redacted BRIEF in Support re 228 MOTION to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents (<i>1 Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and 2 MOTION to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents filed by VARIAN MEDICAL SYSTEMS, INC.</i>) (Poppe, Matthew) Modified on 2/1/2008 (ept). (Entered: 01/31/2008)
01/31/2008	230	DECLARATION in Support re 228 of Matthew H. Poppe ISO Varian Medical Systems, Inc.'s (<i>1 Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and 2 Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents</i>) by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F # 7 Exhibit G # 8 Exhibit H # 9 Exhibit I # 10 Exhibit J # 11 Exhibit K # 12 Exhibit L) (Poppe, Matthew) Modified on 2/1/2008 to add document linkage (ept). (Entered: 01/31/2008)
01/31/2008	231	EXHIBITS M, N, O, P, Q, R, S, T in Support of 230 Declaration, by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit M # 2 Exhibit N # 3 Exhibit O # 4 Exhibit P # 5 Exhibit Q # 6 Exhibit R # 7 Exhibit S # 8 Exhibit T) (Poppe, Matthew) (Entered: 01/31/2008)
01/31/2008	232	EXHIBITS U, V, W, X, Y, Z, AA, BB, CC, DD, EE, FF, GG, HH, II, JJ, KK, LL, MM, OO, PP, QQ, RR in Support of 230 Declaration, by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Exhibit U # 2 Exhibit V # 3 Exhibit W # 4 Exhibit X # 5 Exhibit Y # 6 Exhibit Z # 7 Exhibit AA # 8 Exhibit BB # 9 Exhibit CC # 10 Exhibit DD # 11 Exhibit EE # 12 Exhibit FF # 13 Exhibit GG # 14 Exhibit HH # 15 Exhibit II # 16 Exhibit JJ # 17 Exhibit KK # 18 Exhibit LL # 19 Exhibit MM # 20 Exhibit NN # 21 Exhibit OO # 22 Exhibit PP # 23 Exhibit QQ # 24 Exhibit RR) (Poppe, Matthew) (Entered: 01/31/2008)
01/31/2008	233	DISCOVERY DISPUTE CERTIFICATE by VARIAN MEDICAL

		SYSTEMS, INC. re 228 MOTION to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents (1) <i>Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and (2) Motion to Compel MOTION to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents (1) Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and (2) Motion to Compel.</i> (Poppe, Matthew) (Entered: 01/31/2008)
01/31/2008	234	SEALED DOCUMENT - Memorandum in Support of 228 Motion to Compel by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Exhibit I # Exhibit N) (ept) (Entered: 02/01/2008)
02/01/2008		ORDER Response/Briefing Schedule re 228 Motion to Compel, (Responses due by 2/7/2008 at Noon). Signed by Judge Arthur J. Schwab on 2/1/08 Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter.(ms) (Entered: 02/01/2008)
02/06/2008	235	Unopposed MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Clougherty, Shannon) (Entered: 02/06/2008)
02/06/2008	236	MOTION for Leave to File Amended Answer & Counterclaim by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Exhibit A # 2 Proposed Order) (Poppe, Matthew) Modified on 2/7/2008 to rename attachment (ept). (Entered: 02/06/2008)
02/06/2008	237	DECLARATION re 236 MOTION for Leave to File Amended Answer & Counterclaim by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit J # 6 Exhibit K # 7 Exhibit L # 8 Exhibit M # 9 Exhibit N # 10 Exhibit O # 11 Exhibit P # 12 Exhibit Q # 13 Exhibit S # 14 Exhibit T # 15 Exhibit U # 16 Exhibit V) (Poppe, Matthew) (Entered: 02/06/2008)
02/06/2008	238	MOTION for Leave of Court To File Documents Under Seal by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 02/06/2008)
02/07/2008	239	ORDER granting 235 Motion for Leave to File Documents under Seal. Signed by Judge Arthur J. Schwab on 02/07/08. (eca) (Entered: 02/07/2008)
02/07/2008	240	ORDER granting 238 Motion to File Documents Under Seal. Signed by Judge Arthur J. Schwab on 02/07/08. (eca) (Entered: 02/07/2008)
02/07/2008	241	BRIEF in Opposition re 228 MOTION to Compel Plaintiff to Provide Further Discovery Responses and Produce Documents (1) <i>Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and (2) Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents filed by UNIVERSITY OF</i>

		PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) Modified on 2/8/2008 (ept). (Entered: 02/07/2008)
02/07/2008	242	DECLARATION of Darcy A. Paul in Support of 241 Plaintiff University of Pittsburgh's Opposition to Varian Medical System Inc.'s (1) Motion to Compel Plaintiff University of Pittsburgh to Provide further Discovery Responses and Produce Documents and for Sanctions, and (2) Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C) (Paul, Darcy) Modified on 2/8/2008 to add document linkage (ept). (Entered: 02/07/2008)
02/07/2008		ORDER REQUIRING RESPONSE to 236 Motion for Leave to File Amended Answer and Counterclaim. Response to Motion due by 2/14/2008 at NOON. Signed by Judge Arthur J. Schwab on 02/07/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 02/07/2008)
02/07/2008	243	SEALED DOCUMENT - Exhibits A-C in support of 241 Brief in Opposition by UNIVERSITY OF PITTSBURGH (ept) (Entered: 02/07/2008)
02/07/2008	244	SEALED MOTION for Leave to File Amended Answer and Counterclaim by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # Exhibit A # Exhibit E # Exhibit F # Exhibit G # Exhibit H # Exhibit I # Exhibit R # Proposed Order) (ept) (Entered: 02/07/2008)
02/08/2008	245	MOTION for Leave to File Reply in Support of (1) Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions, and (2) Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit # 2 Proposed Order) (Poppe, Matthew) (Entered: 02/08/2008)
02/08/2008	246	ORDER granting in part and denying in part 228 Motion to Compel. Signed by Judge Arthur J. Schwab on 2/8/08. (ms) (Entered: 02/08/2008)
02/11/2008		ORDER denying as moot 245 Motion for Leave to File Reply in Support of (1) Motion to Compel Plaintiff University of Pittsburgh to Provide Further Discovery Responses and Produce Documents and for Sanctions and (2) Motion to Compel Non-Parties University of Pittsburgh Medical Center and Dr. Jeff Shogan to Produce Documents. Signed by Judge Arthur J. Schwab on 02/11/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 02/11/2008)
02/11/2008		Minute Entry for proceedings held before Judge Arthur J. Schwab: Court overruled plaintiff's objections to deposition issue. (Court Reporter: K. Earley) (ms). (Entered: 02/11/2008)

02/14/2008	247	MOTION to Seal Document by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Paul, Darcy) (Entered: 02/14/2008)
02/14/2008	248	RESPONSE to Motion re 244 SEALED MOTION <i>for Leave to file Amended Answer and Counterclaim</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 02/14/2008)
02/14/2008	249	DECLARATION <i>of Rita Tautkus in Support of 248 Plaintiff's Opposition to Varian Medical System Inc.'s Motion for Leave to File Ameneded Answer and Counterclaim</i> by UNIVERSITY OF PITTSBURGH Affiant: Rita Tautkus.. (Attachments: # 1 Exhibit A) (Tautkus, Rita) Modified on 2/15/2008 to add document linkage (ept). (Entered: 02/14/2008)
02/15/2008	250	ORDER granting 247 Motion for Leave of Court to File Documents Under Seal. The deposition transcript of Mr. Richard Westerhoff, dated 10/03/07, at page 104, shall be filed under seal. Signed by Judge Arthur J. Schwab on 02/15/08. (eca) (Entered: 02/15/2008)
02/15/2008	251	SUPPLEMENTAL ORDER DENYING in part 228 MOTION to Compel as follows: UPMC and/or Dr. Shogan shall not be required to produce (1) a complete and unredacted copy of the email previously produced as VMSJES017, (2) a complete and unredacted copy of Greenberger memorandum previously produced as VMSJES009, and (3) complete and unredacted copies of other withheld documents listed in the letter from Al Ciocca, Esq. dated 08/24/07 and attached as Exhibit M to the Declaration of Matthew H. Poppe. Plaintiff's, UPMC's, and Dr. Shogan's objections to the production of said documents based on the attorney-client privilege, attorney work product doctrine, and/or common interest privilege are sustained. Mr. Ciocca shall retrieve from the Court the unredacted document delivered to the Court for <i>incamera</i> inspection on 02/14/08. Said retrieval shall occur on or before 02/21/08 from Deputy Clerk or other staff personnel. Signed by Judge Arthur J. Schwab on 02/15/08. (eca) (Entered: 02/15/2008)
02/15/2008	252	ORDER denying 236 Motion for Leave to File Amended Answer and Counterclaim. Signed by Judge Arthur J. Schwab on 02/15/08. (eca) (Entered: 02/15/2008)
02/19/2008	253	SEALED DOCUMENT - Deposition Transcript of Mr. Richard Westerhoff by UNIVERSITY OF PITTSBURGH (ept) (Entered: 02/19/2008)
03/10/2008	254	REPORT AND RECOMMENDATION of Special Master Ziegler on 3/8/08 re 127 SEALED MOTION filed by VARIAN MEDICAL SYSTEMS, INC. (ms) (Entered: 03/10/2008)
03/10/2008		ORDER SETTING DEADLINE FOR OBJECTIONS to 254 Report and Recommendations of Special Master. Objections due by 3/18/2008 at NOON. Signed by Judge Arthur J. Schwab on 03/10/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 03/10/2008)

03/18/2008	255	RESPONSE to 254 Special Master's Report and Recommendations filed by UNIVERSITY OF PITTSBURGH. (Tautkus, Rita) Modified on 3/19/2008 (ept). (Entered: 03/18/2008)
03/18/2008	256	OBJECTIONS to 254 Report and Recommendation of <i>Special Master Re: Motion for Summary Judgment for Lack of Standing.</i> (Attachments: # 1 Proposed Order) (Sneath, Henry) (Entered: 03/18/2008)
03/18/2008	257	DECLARATION of Henry M. Sneath in Support of 256 Defendant/Counterclaimant's Objections to Report & Recommendation of Special Master by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit F) (Sneath, Henry) Modified on 3/19/2008 to add document linkage (ept). (Entered: 03/18/2008)
03/19/2008	258	Unopposed MOTION for Leave to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Proposed Order) (Sneath, Henry) (Entered: 03/19/2008)
03/19/2008	259	MOTION for Leave Leave of Court to File Documents Under Seal by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (Poppe, Matthew) Modified on 3/20/2008 to modify text (ept). (Entered: 03/19/2008)
03/20/2008		ORDER: The parties are hereby directed to file reply briefs to 256 Objections to Report and Recommendation and 255 Response filed by UNIVERSITY OF PITTSBURGH by NOON on 3/26/2007. Reply briefs are not to exceed ten (10) pages. Signed by Judge Arthur J. Schwab on 03/20/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 03/20/2008)
03/20/2008	260	ORDER granting 258 Motion for Leave to File Documents under Seal. Signed by Judge Arthur J. Schwab on 03/20/08. (eca) (Entered: 03/20/2008)
03/20/2008	261	ORDER granting 259 Motion for Leave to File Documents under Seal. Signed by Judge Arthur J. Schwab on 03/20/08. (eca) (Entered: 03/20/2008)
03/20/2008	262	ORDER SETTING STATUS / SETTLEMENT CONFERENCE: A Status/Settlement Conference shall be held 03/28/08 at 8:00 AM. Chief trial counsel and chief decisionmakers shall attend in person and be prepared to discuss schedule, settlement, and further alternative dispute resolution options. By NOON on 03/26/08 each party shall submit brief confidential letters to the Court and a proposed settlement agreement. Signed by Judge Arthur J. Schwab on 03/20/08. (eca) (Entered: 03/20/2008)
03/20/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 259 Motion for Leave to File. ERROR: Signature on document and filer do not match. Attorney advised that in the future, the signature and filer on documents must match. This message is for informational purposes only.

		(ept) (Entered: 03/20/2008)
03/20/2008	263	MOTION for Sanctions <i>Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285</i> by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (Poppe, Matthew). This document terminated and redocketed at 267 . Modified on 3/24/2008 (ept). (Entered: 03/20/2008)
03/20/2008	264	MOTION to Amend/Correct 263 MOTION for Sanctions <i>Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285</i> by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (Poppe, Matthew). This document has been terminated. Modified on 3/24/2008 (ept). (Entered: 03/20/2008)
03/20/2008	265	BRIEF in Support re 267 MOTION for Sanctions Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285 filed by VARIAN MEDICAL SYSTEMS, INC. (Poppe, Matthew) Modified on 3/24/2008 to modify text(ept). (Entered: 03/20/2008)
03/20/2008	266	DECLARATION re 265 Brief in Support of Motion for Sanctions Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285 by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A # 2 Exhibit B # 3 Exhibit C # 4 Exhibit D # 5 Exhibit E # 6 Exhibit I # 7 Exhibit J # 8 Exhibit K # 9 Exhibit M # 10 Exhibit S # 11 Exhibit T # 12 Exhibit U # 13 Exhibit V # 14 Exhibit X # 15 Exhibit Y # 16 Exhibit Z) (Poppe, Matthew) (Entered: 03/20/2008)
03/20/2008	267	MOTION for Sanctions Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285 by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (ept) (Entered: 03/24/2008)
03/20/2008	268	SEALED DOCUMENT - Memorandum in Support of 267 Motion for Sanctions by VARIAN MEDICAL SYSTEMS, INC. (ept) (Entered: 03/24/2008)
03/20/2008	269	SEALED DOCUMENT - Declaration in support of 267 Motion for Sanctions by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # Exhibit F # Exhibit G # Exhibit H # Exhibit L # Exhibit N # Exhibit O # Exhibit P # Exhibit Q # Exhibit R # Exhibit W # Exhibit AA) (ept) (Entered: 03/24/2008)
03/21/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 264 Motion to Amend/Correct. ERROR: Wrong event selected. Filer should have used Errata event. CORRECTION: Motion to Amend 264 terminated. Motion for Sanctions 263 wrong document was attached. The motion is filed at 264 . This message is for informational purposes only. (crw) (Entered: 03/21/2008)
03/25/2008		ORDER SETTING DEADLINE FOR RESPONSE to 267 Motion for Sanctions. Response to Motion due by 3/27/2008 at NOON. Signed by Judge Arthur J. Schwab on 03/25/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 03/25/2008)

03/26/2008	270	MOTION for Leave to File <i>DOCUMENT UNDER SEAL</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 03/26/2008)
03/26/2008	271	REPLY BRIEF by VARIAN MEDICAL SYSTEMS, INC. re 255 Response to <i>Special Master's Report & Recommendations</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 03/26/2008)
03/26/2008	272	REPLY BRIEF by UNIVERSITY OF PITTSBURGH to 256 <i>Objections to Report and Recommendation</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Appendix A) (Tautkus, Rita) Modified on 3/27/2008 to add proper document linkage (ept). (Entered: 03/26/2008)
03/27/2008	273	ORDER granting 270 Motion for Leave to File Documents Under Seal. Excerpts from the deposition transcripts designated as Confidential Attorney Eyes Only under the Protective Order entered in this matter shall be filed under seal. Signed by Judge Arthur J. Schwab on 03/27/08. (eca) (Entered: 03/27/2008)
03/27/2008	274	BRIEF in Opposition re 263 MOTION for Sanctions <i>Pursuant to Rule 11 of the F.R.C.P. and/or 35 U.S.C. Section 285</i> filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Johnson, Daniel) (Entered: 03/27/2008)
03/27/2008	275	OBJECTIONS to <i>PLAINTIFF'S ATTEMPT TO INTRODUCE NEW EVIDENCE</i> by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 03/27/2008)
03/27/2008	276	Errata re 275 Objections <i>TO PLAINTIFF'S ATTEMPT TO INTRODUCE NEW EVIDENCE</i> by VARIAN MEDICAL SYSTEMS, INC.. Reason for Correction: Wrong filer. (Liu, Zheng) (Entered: 03/27/2008)
03/27/2008	277	SEALED DOCUMENT - Appendix A to 256 Objections to Report and Recommendation by UNIVERSITY OF PITTSBURGH (ept) (Entered: 03/27/2008)
03/27/2008	278	MOTION for Leave to File Sur-Reply <i>TO ADDRESS NEW ARGUMENTS IMPROPERLY RAISED BY PLAINTIFF UNIVERSITY OF PITTSBURGH IN ITS REPLY TO VARIAN'S OBJECTIONS TO REPORT AND RECOMMENDATION</i> by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Exhibit 1 # 2 Exhibit 2) (Poppe, Matthew) Modified on 3/28/2008 to modify text (ept). (Entered: 03/27/2008)
03/28/2008		ORDER granting 278 Motion for Leave to File sur-reply brief, without objection. Signed by Judge Arthur J. Schwab on 3/28/08. (mjl) (Entered: 03/28/2008)
03/28/2008	279	Minute Entry for proceedings held before Judge Arthur J. Schwab: Status Conference held on 3/28/2008. (Court Reporter: K. Earley) (mjl) (Entered: 03/28/2008)

03/28/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 275 Objections. ERROR: Signature on document and filer do not match. CORRECTION: Attorney advised of signature requirements. Attorney to resubmit the document using the Errata event. This message is for informational purposes only. (ept) (Entered: 03/28/2008)
03/28/2008		Remark: Clerk's Office inadvertently sent a Quality Control message regarding 275 . Attorney correctly refiled the document at 276 . (ept) (Entered: 03/28/2008)
03/28/2008	280	SUPERSEDING ORDER GRANTING 278 Motion for Leave to File Sur-Reply. The Sur-Reply shall be filed today on ECF. Signed by Judge Arthur J. Schwab on 03/28/08. (eca) (Entered: 03/28/2008)
03/28/2008	281	<i>Sur-Reply Brief to Address New Arguments Raised by Plaintiff in its Reply to Varian's Objections to Report and Recommendation</i> filed by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 03/28/2008)
04/01/2008		ORDER REQUIRING RESPONSE to 275 Objections to Plaintiff's Attempt to Introduce New Evidence. Response due by 4/3/2008 at NOON. Signed by Judge Arthur J. Schwab on 04/01/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 04/01/2008)
04/01/2008	282	REVISED Minute Entry for proceedings held before Judge Arthur J. Schwab : Status Conference held on 3/28/2008. (Court Reporter: K. Earley) (mjl) (Entered: 04/01/2008)
04/03/2008	283	RESPONSE to Defendant's 275 Objections to Plaintiff's Attempt to Introduce New Evidence filed by UNIVERSITY OF PITTSBURGH. (Tautkus, Rita) Modified on 4/4/2008 to add document linkage (ept). (Entered: 04/03/2008)
04/03/2008	284	MOTION for Reconsideration re 282 Status Conference, 279 Status Conference of the Court's Finding of Contempt by UNIVERSITY OF PITTSBURGH. (Johnson, Daniel) (Entered: 04/03/2008)
04/03/2008	285	DECLARATION re 284 MOTION for Reconsideration re 282 Status Conference, 279 Status Conference of the Court's Finding of Contempt by UNIVERSITY OF PITTSBURGH. (Johnson, Daniel) (Entered: 04/03/2008)
04/03/2008	286	MOTION for Contempt Sanctions by VARIAN MEDICAL SYSTEMS, INC. (Attachments: # 1 Proposed Order) (Poppe, Matthew) Text modified on 4/4/2008 (ept). (Entered: 04/03/2008)
04/03/2008	287	DECLARATION of Matthew H. Poppe re 286 MOTION for Contempt Sanctions by VARIAN MEDICAL SYSTEMS, INC. (Poppe, Matthew) Text modified on 4/4/2008 (ept). (Entered: 04/03/2008)
04/03/2008	288	DECLARATION of Henry M. Sneath re 286 MOTION for Contempt Sanctions by VARIAN MEDICAL SYSTEMS, INC. (Poppe, Matthew) Text modified on 4/4/2008 (ept). (Entered: 04/03/2008)

04/03/2008	289	DECLARATION of Keith Askoff re 286 MOTION for Contempt Sanctions by VARIAN MEDICAL SYSTEMS, INC. (Poppe, Matthew) Text modified on 4/4/2008 (ept). (Entered: 04/03/2008)
04/04/2008		ORDER SETTING DEADLINE FOR RESPONSES to 286 Motion for Sanctions and 284 Motion for Reconsideration. Responses to these Motions are due by 4/8/2008 at NOON. Signed by Judge Arthur J. Schwab on 04/04/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 04/04/2008)
04/08/2008	290	RESPONSE to Motion re 284 MOTION for Reconsideration re 282 Status Conference, 279 Status Conference of the Court's Finding of Contempt filed by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit "A") (Sneath, Henry) (Entered: 04/08/2008)
04/08/2008	291	BRIEF in Opposition re 286 MOTION for Contempt Sanctions filed by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A # 2 Proposed Order) (Tautkus, Rita) Text modified on 4/9/2008 (ept). (Entered: 04/08/2008)
04/08/2008	292	DECLARATION of Laura Hillock in Support of Plaintiff's 291 Opposition to Varian's Motion for Contempt Sanctions 286 by UNIVERSITY OF PITTSBURGH. (Tautkus, Rita) Modified on 4/9/2008 to add document linkage (ept). (Entered: 04/08/2008)
04/17/2008	293	ORDER denying 284 Motion for Reconsideration ; granting in part and denying in part 286 Motion for Sanctions. Signed by Judge Arthur J. Schwab on 4/17/08. (mjl) (Entered: 04/17/2008)
04/30/2008		TEXT ORDER -- Upon consideration of Defendant's Objection to Plaintiff's Attempt to Introduce New Evidence (doc. no. 275) and Plaintiff's Response to Defendant's Objection to Plaintiff's Attempt to Introduce New Evidence (doc. no. 283), the Court overrules said objections. Text-only entry; no PDF document will issue. This text-only entry constitutes the Courts order or notice on the matter. Signed by Judge Arthur J. Schwab on 4/30/08. (ms) (Entered: 04/30/2008)
04/30/2008		TEXT ORDER -- After consideration of defendant's Motion for Sanctions Pursuant to Rule 11 of the Federal Rules of Civil Procedure and/or 35 U.S.C. § 285 (doc. no. 267) and brief in support thereof (doc. no. 268), and Plaintiff University of Pittsburgh's Opposition to Defendant Varian Medical Systems, Inc.'s Motion for Sanctions Pursuant to Rule 11 of the Federal Rules of Civil Procedure and/or 35 U.S.C. § 285 (doc. no. 274), said Motion (doc. no. 267) is DENIED. Text-only entry; no PDF document will issue. This text-only entry constitutes the Court's order or notice on the matter. Signed by Judge Arthur J. Schwab on 4/30/08. (ms) (Entered: 04/30/2008)
04/30/2008	294	ORDER ADOPTING 254 Special Master's Report and Recommendations in part and Granting 127 Defendant's Motion for Summary Judgment for Lack of Standing. This civil action is dismissed with prejudice. The Clerk shall mark this CASE CLOSED. Signed by

		Judge Arthur J. Schwab on 04/30/08. (eca) (Entered: 04/30/2008)
05/01/2008		Remark: E-mail notification to U.S. Patent and Trademark Office of case closing, with Order attached, was sent on 5/1/2008. (ept) (Entered: 05/01/2008)
05/15/2008	295	MOTION Requesting Entry Of Judgment by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Exhibit A, # 2 Exhibit B) (Tautkus, Rita) Text modified on 5/16/2008 (ept). (Entered: 05/15/2008)
05/15/2008	296	MOTION to Dismiss <i>Counterclaims without Prejudice and (2) for Entry of Final Judgment</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit A, # 2 Exhibit B, # 3 Exhibit C, # 4 Exhibit D, # 5 Exhibit E) (Poppe, Matthew) (Entered: 05/15/2008)
05/15/2008	297	Proposed Order re 296 MOTION to Dismiss <i>Counterclaims without Prejudice and (2) for Entry of Final Judgment</i> by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 05/15/2008)
05/16/2008		w/ 296 MOTION for Entry of Judgment by VARIAN MEDICAL SYSTEMS, INC. (ept) (Entered: 05/16/2008)
05/16/2008		CLERK'S OFFICE QUALITY CONTROL MESSAGE re 296 Motion to Dismiss. ERROR: MULTIPLE Relief Motion Filed as One Relief. CORRECTION: Attorney advised in future that Motions of this nature are to be filed using the Motion Event and choosing all the Reliefs requested by holding the Control Key down and clicking all the reliefs sought in said motion. Clerk of Court docketed Motion for Entry of Judgment. This message is for informational purposes only. (ept) (Entered: 05/16/2008)
05/19/2008		ORDER Response/Briefing Schedule re 295 Motion for Judgment, 296 Motion to Dismiss - Responses due by 5/27/2008. Signed by Judge Arthur J. Schwab on 5/19/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (ms) (Entered: 05/19/2008)
05/23/2008	298	NOTICE of Appearance by Elizabeth Stroyd Windsor on behalf of UNIVERSITY OF PITTSBURGH (Windsor, Elizabeth) (Entered: 05/23/2008)
05/27/2008	299	BRIEF in Opposition re 295 Motion Requesting Entry of Judgment filed by VARIAN MEDICAL SYSTEMS, INC. (Poppe, Matthew) Text modified on 5/28/2008. (ept) (Entered: 05/27/2008)
05/27/2008	300	RESPONSE to Motion re 296 Motion to Dismiss, Motion for Entry of Judgment filed by UNIVERSITY OF PITTSBURGH. (Tautkus, Rita) Text modified on 5/28/2008. (ept) (Entered: 05/27/2008)
05/30/2008	301	Joint MOTION to Stay <i>Proceedings Pending Mediation</i> by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) (Entered: 05/30/2008)
06/02/2008	302	ORDER granting 301 Motion to Stay. All proceedings in this action,

		except for Plaintiff's anticipated motion to purge itself of contempt, affidavit of compliance and the neutral's ADR Report are STAYED until 06/16/08. Signed by Judge Arthur J. Schwab on 06/02/08. (eca) (Entered: 06/02/2008)
06/13/2008	303	REPORT of Mediation: Settlement has not been reached. Amount of discovery conducted: None. For cases participating in the Court's ADR pilot project, the parties are reminded of their obligation to complete the ADR questionnaire and return same to the Clerk of Court within 5 days of the conclusion of the ADR process. The questionnaire can be accessed at www.pawd.uscourts.gov. Click on the ADR icon. Mediation session was held on 6/12/2008. (Byer, Robert) (Entered: 06/13/2008)
06/13/2008	304	Errata re 303 Report of Mediation, by ROBERT L. BYER. Reason for Correction: Adding list of attendees. (Byer, Robert) (Entered: 06/13/2008)
06/13/2008	305	MOTION to Purge Contempt Finding by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Tautkus, Rita) Text modified on 6/16/2008. (ept) (Entered: 06/13/2008)
06/13/2008	306	DECLARATION re 305 MOTION Purge Contempt Finding by UNIVERSITY OF PITTSBURGH Affiant: Rita E. Tautkus. (Attachments: # 1 Exhibit A) (Tautkus, Rita) Text modified on 6/16/2008. (ept) (Entered: 06/13/2008)
06/13/2008	307	RESPONSE to Motion re 305 Motion to Purge Contempt Filed by VARIAN MEDICAL SYSTEMS, INC. (Liu, Zheng) Text modified on 6/16/2008. (ept) (Entered: 06/13/2008)
06/16/2008	308	ORDER granting 305 Motion to Purge Contempt. The Court thanks the parties and counsel for their good faith efforts in conducting a meaningful mediation conference. Signed by Judge Arthur J. Schwab on 06/16/08. (eca) (Entered: 06/16/2008)
06/16/2008	309	ORDER granting 296 Motion to Dismiss Without Prejudice. Signed by Judge Arthur J. Schwab on 6/16/08. (mjl) Modified on 6/17/2008 to reflect "Without Prejudice." (eca) (Entered: 06/16/2008)
06/16/2008	310	JUDGMENT in favor of Defendant Varian Medical Systems, Inc. and against Plaintiff University of Pittsburgh. Signed by Judge Arthur J. Schwab on 06/16/08. (eca) (Entered: 06/16/2008)
06/16/2008	311	NOTICE OF APPEAL as to 310 Judgment by UNIVERSITY OF PITTSBURGH. Filing fee \$ 455, receipt number 0315000000000924422. The Clerk's Office hereby certifies the record and the docket sheet available through ECF to be the certified list in lieu of the record and/or the certified copy of the docket entries. The Transcript Purchase Order form will NOT be mailed to the parties. The form is available on the Court's internet site. (Tautkus, Rita) (Entered: 06/16/2008)

06/20/2008		Remark: Certified copies of the docket sheet, judgment and notice of appeal mailed to the Federal Circuit Court of Appeals. (ept) (Entered: 06/20/2008)
06/20/2008	312	BILL OF COSTS by VARIAN MEDICAL SYSTEMS, INC. in the amount of \$356,269.90 against University of Pittsburgh. (Poppe, Matthew) (Entered: 06/20/2008)
06/20/2008	313	MOTION for Bill of Costs <i>ITEMIZATION OF COSTS ISO OF BILL OF COSTS</i> by VARIAN MEDICAL SYSTEMS, INC.. (Poppe, Matthew) (Entered: 06/20/2008)
06/20/2008	314	DECLARATION re 312 Bill of Costs, 313 MOTION for Bill of Costs <i>ITEMIZATION OF COSTS ISO OF BILL OF COSTS DECLARATION OF MATTHEW H. POPPE ISO VARIAN'S BILL OF COSTS</i> by VARIAN MEDICAL SYSTEMS, INC.. (Attachments: # 1 Exhibit 1, # 2 Exhibit 2, # 3 Exhibit 3, # 4 Exhibit 4, # 5 Exhibit 5, # 6 Exhibit 6, # 7 Exhibit 7, # 8 Exhibit 8A, # 9 Exhibit 8B, # 10 Exhibit 8C, # 11 Exhibit 8D) (Poppe, Matthew) (Entered: 06/20/2008)
06/23/2008		ORDER SETTING DEADLINE FOR RESPONSE to 313 Motion for Bill of Costs. Response to Motion due by 7/3/2008 at NOON. Reply due by 7/8/2008 at NOON. Signed by Judge Arthur J. Schwab on 06/23/08. Text-only entry; no PDF document will issue. This text-only entry constitutes the Order of the Court or Notice on the matter. (eca) (Entered: 06/23/2008)
06/25/2008	315	MOTION for attorney Richard J Johnson to Appear Pro Hac Vice, Filing fee \$ 40 Receipt # 0315000000000934105 by UNIVERSITY OF PITTSBURGH. (Attachments: # 1 Proposed Order) (Johnson, Richard) (Entered: 06/25/2008)
06/25/2008	316	MOTION for attorney Roderick R. McKelvie to Appear Pro Hac Vice, Filing fee \$ 40 Receipt # 0315000000000934242 by UNIVERSITY OF PITTSBURGH. (McKelvie, Roderick) (Entered: 06/25/2008)
06/26/2008	317	ORDER granting 315 Motion for Richard J. Johnson to Appear Pro Hac Vice. Attorney Johnson added. Signed by Judge Arthur J. Schwab on 06/26/08. (eca) (Entered: 06/26/2008)
06/26/2008	318	ORDER granting 316 Motion for Roderick R. McKelvie to Appear Pro Hac Vice. Attorney McKelvie added. Signed by Judge Arthur J. Schwab on 06/26/08. (eca) (Entered: 06/26/2008)

PACER Service Center			
Transaction Receipt			
06/27/2008 15:07:17			
PACER Login:	oh0026	Client Code:	3424-2015
Description:	Docket Report	Search Criteria:	2:07-cv-00491-AJS
Billable Pages:	28	Cost:	2.24

EXHIBIT F

In The Matter Of:

*University Of Pittsburgh v.
Varian Medical Systems, INC.,*

*Claim Construction Hearing
November 29, 2007*

*Morse Gantverg & Hodge Court Reporters, Inc.
Suite 719, One Bigelow Square
Pittsburgh, Pennsylvania 15219
1-800-966-4157*

Original File leh4129.txt, Pages 1-306

Word Index included with this Min-U-Script®

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Claim Construction Hearing
November 29, 2007

Page 1

Page 3

[1] IN THE UNITED STATES DISTRICT COURT
[2] FOR THE WESTERN DISTRICT OF PENNSYLVANIA
[3] - - -
[4] UNIVERSITY OF PITTSBURGH,)
[5] Plaintiff,)
[6] vs.) Case No.
[7] VARIAN MEDICAL SYSTEMS, INC.,) 2:07-CV-00491-AJS
[8] Defendant.)
[9] - - -
[10] CLAIM CONSTRUCTION HEARING
[11] Thursday, November 29, 2007
[12] - - -
[13] The hearing before DONALD E. ZIEGLER, taken
before me, the undersigned, Lance E. Hannaford, a
Notary Public in and for the Commonwealth of
Pennsylvania, at the offices of 32nd Floor, One Oxford
Centre, Pittsburgh, Pennsylvania 15219, commencing at
9:00 o'clock a.m., the day and date above set forth.

[17] COMPUTER-AIDED TRANSCRIPTION BY
MORSE, GANTVERG & HODGE, INC.
PITTSBURGH, PENNSYLVANIA
412-281-0189
- - -
[19]
[20]
[21]
[22]
[23]
[24]
[25]

JUDGE ZIEGLER: This case is entitled University of Pittsburgh as plaintiff versus Varian Medical Systems, Incorporated as defendant.

Civil action No. 2:07-CV-00491 pending before Judge Schwab in United States District Court for the western district of Pennsylvania. Further pending before the special master are two motions.

The motion of the University of Pittsburgh to strike the defendant's tutorial, that motion will be denied.

There is also a motion that pertains to summary judgment raising the issue of standing.

We will of course take that matter under advisement.

Next, the parties have agreed in a case management order concerning the format for today's hearing.

As I recall in looking at it last night, in general each side is given 2.5 hours to present their respective positions.

At the outset we will begin with a 15 minute opening statement and a tutorial to be presented by each side.

Page 2

Page 4

[1] APPEARANCES:
[2] On behalf of the Plaintiff:
[3] Morgan Lewis:
[4] Daniel Johnson, Jr., Esquire
Rita Tautkus, Esquire
One Market, Spear Street Tower
San Francisco, California 94105
[5] Morgan Lewis:
[6] John D. Zele, Esquire
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
[7] On behalf of the Defendant:
[8] Orrick Herrington & Sutcliffe:
Matthew H. Poppe, Esquire
William Anthony, Esquire
Zheng Liu, Esquire
1000 Marsh Road
Menlo Park, California 94025
Picadio Sneath Miller & Norton:
Henry M. Sneath, Esquire
4710 U.S. Steel Tower
Pittsburgh, Pennsylvania 15219
[9] ALSO PRESENT:
[10] Moira Cain-Mannix
Laura Hilllock
Theresa Colecchia
Dr. James Balter
Dr. Steven Jiang
Dr. Joel Greenberger
Dr. Michael Schell
[11] I-N-D-E-X
[12] WITNESS: DIRECT CROSS REDIRECT RECROSS
Michael Schell 75 78 99
80 91 189
James Balter 103 134 148 152
Steve Jiang 154 173 185
- - -

University of Pittsburgh of course as plaintiff will proceed first.

As far as I am concerned, Mr. Johnson, you can intermingle your opening statement with the tutorial, if you want to.

Whatever format you want to use for that purpose is your call.

MR. JOHNSON: My call is start with the tutorial.

And then focus on my opening remarks after that.

JUDGE ZIEGLER: You may proceed.

MR. JOHNSON: Your Honor, we will have Dr. Joel Greenberger handle the tutorial.

He has a series of animations.

JUDGE ZIEGLER: Let me say one final point.

To make certain that I receive all of the papers, motions, pleadings, that you may file in due course, I would ask you, if you would, please, could you also send me one courtesy copy in hard copy in due course?

That would be helpful.

DR. GREENBERGER: My name is Dr. Joel Greenberger. I am a radiation oncologist with the University of Pittsburgh.

Page 5

Page 7

[1] I wanted to go through a background of
[2] radiation therapy and how certain problems have
[3] arisen, which we have tried to approach.

[4] Cancer is a group of diseases in which
[5] human cells grow, mutate aggressively, invade
[6] normal tissues and destroy the normal tissues as
[7] they invade.

[8] Radio therapy, which is also called
[9] radiation therapy or x-ray therapy, teletherapy
[10] or irradiation, is one of the modalities we use
[11] to treat cancer.

[12] Most patients are seen by at least three
[13] doctors, a surgeon, a radiation oncologist and a
[14] medical oncologist.

[15] The goal of radiotherapy is to damage as
[16] many cancer cells in a target volume as possible
[17] while limiting the dose to nearby healthy
[18] tissues.

[19] So as radiation oncologist, very similar to
[20] surgeons, are concerned about anatomy and
[21] targeting the tumor while protecting normal
[22] tissue.

[23] Medical oncology is concerned with giving
[24] chemotherapy, which goes systemically through the
[25] patient and gets everywhere.

[1] Low or kilovoltage or orthovoltage x-rays
[2] are used to take these pictures.

[3] In the spectrum of x-ray energy, higher
[4] energy x-rays are used in treatment.

[5] This is because they can penetrate the
[6] tissues deeper and spare the skin.

[7] Now, the visible light range here is in the
[8] middle.

[9] It is important to note the infrared
[10] spectrum and the x-ray spectrum cannot be seen by
[11] people.

[12] And infrared as well as x-ray spectrum was
[13] well understood in the early '90s and was used in
[14] various types of technologies.

[15] All of which was available at the time we
[16] began working on this problem.

[17] Now, x-rays have a wide range of energies.
[18] The low or kilovoltage x-rays produce higher
[19] contrast images. That is why they are used in
[20] diagnostic x-rays when you go to the hospital.

[21] Lower energy x-rays may also be used in
[22] treatment.

[23] We use low energy kilovoltage x-rays to
[24] treat skin cancer.

[25] This is because energy builds up in the

Page 6

Page 8

[1] Now, when radiotherapy is delivered, what
[2] happens is radiation beams traverse the cancer
[3] cells shown here in the middle.

[4] The goal is to kill the cancer cells and
[5] allow repopulation of that area by normal tissue.

[6] You can see these examples of how the beam
[7] is hitting the cancer.

[8] The beam is also traversing normal tissue
[9] at every one of its movements.

[10] So normal tissue, normal cells are going to
[11] be damaged.

[12] And a goal of radiotherapy is to get as
[13] high a possible dose to the tumor cells as
[14] possible without hurting the normal tissue. That
[15] ultimately translates in to hurting the patient.

[16] X-rays have been very useful in
[17] radiotherapy.

[18] Diagnostic x-rays in the low or kilovoltage
[19] range have been used since the early 1900's for
[20] diagnosis.

[21] And as you can see here in this picture of
[22] a hand with a ring, some materials are radio
[23] opaque, meaning few x-rays pass through them.
[24] That is why the ring on the finger shows up
[25] brightly.

[1] skin.

[2] The higher energy x-rays penetrate deep in
[3] to the body.

[4] They deliver better therapeutic doses.

[5] However, the quality of the image you get, when
[6] you use a high energy beam to take a picture is
[7] usually less valuable, because the difference
[8] between the bony landmarks and the air in the
[9] lung is less different.

[10] However, I have to emphasize kilovoltage
[11] x-rays can be used in both treatment and
[12] diagnosis.

[13] And high energy megavoltage x-rays
[14] primarily used in treatment can also be used in
[15] imaging.

[16] Here is a picture, a high energy
[17] megavoltage image can be used to verify anatomic
[18] landmarks.

[19] Although the difference between the rib and
[20] the lung, the heart and the trachea isn't quite
[21] as dramatic as in the kilovoltage example.

[22] Megavoltage imaging can be used.

[23] High energy x-rays penetrate better than
[24] low energy x-rays.

[25] And they are usually better for therapy,

Page 9	Page 11
<p>[1] although we use both high and low energy x-rays in therapy.</p> <p>[3] Now, pictured in this scenario is a patient lying on a treatment table in a radiotherapy room.</p> <p>[6] Exterior beam radiotherapy involves directly applying a treatment beam to the part of the body that requires the treatment.</p> <p>[9] It differs from chemotherapy, as I said before, which involves a chemical infusion into the patient's body that affects the whole body.</p> <p>[12] Now, the components of the linear accelerator here are pretty much the same in all models produced by all companies.</p> <p>[15] There is a linear accelerator machine, which generates the x-rays. There is a collimator for the beam that shapes the beam. And then there is this key component.</p> <p>[19] The gantry, which rotates like a telephone.</p> <p>[21] It looks like a telephone. It rotates.</p> <p>[22] And can move the treatment beam to any of a number of positions.</p> <p>[24] When the treatment is delivered, many components of the machine can be moved to adjust</p>	<p>[1] treatment, a bigger dose.</p> <p>[2] There are problems.</p> <p>[3] When a tumor is discovered, the radiation oncologist may determine radiotherapy is the best course of treatment.</p> <p>[6] Here is an example in which we have a tumor in the lung surrounded by normal lung tissue, heart, spinal cord.</p> <p>[9] At this point the treatment process has two stages.</p> <p>[11] One is called simulation or planning.</p> <p>[12] The other is called treatment.</p> <p>[13] In the simulation process, we usually use the low energy orthovoltage energy to take pictures and to define the size and shape of the beam that we ultimately want to give.</p> <p>[15] In this example, it is a circle.</p> <p>[16] There is a cross section, a size of it. A diameter.</p> <p>[17] And an angle that we want to put the machine at to deliver the treatment.</p> <p>[18] We also fractionate the treatment giving multiple smaller doses on different days.</p> <p>[19] Sometimes twice a day.</p> <p>[20] Sometimes five days a week. Sometimes over</p>
Page 10	Page 12
<p>[1] that beam to a configuration that hits the tumor.</p> <p>[2] Now, what can we do to modify the beam?</p> <p>[3] Beam size and shape can be changed.</p> <p>[4] The cross sectional size and shape of the beam that is applied to the patients can be made thin or thick.</p> <p>[7] And this is because of the changes up here in the collimator.</p> <p>[9] There are other things we can do.</p> <p>[10] We can move the direction of the beam.</p> <p>[11] We can move this gantry, so the beam can come in at an oblique angle, or it can come in from the front or back angle.</p> <p>[14] The goal, of course, is hit the tumor and produce as much damage to the tumor while not hurting the normal tissues.</p> <p>[17] Another thing we can do is to change the dose rate.</p> <p>[19] We can have the machine essentially pump out more radiation per second or per minute than at another time.</p> <p>[22] And the higher dose rate produces greater tissue damage than a lower dose rate.</p> <p>[24] Another parameter we can control.</p> <p>[25] By modifying the time, we can give a bigger</p>	<p>[1] seven weeks duration.</p> <p>[2] Every time we deliver a treatment, we run the risk of not hitting the cancer volume.</p> <p>[3] We run the risk of treating too much normal tissue.</p> <p>[6] The simulation phase is carried out using a machine called a simulator.</p> <p>[7] It usually produces a picture with a low energy orthovoltage image.</p> <p>[10] And this image is then used to match it to a treatment image.</p> <p>[12] It is important, because the simulation is carried out infrequently, whereas the treatments are carried out daily or sometimes more than once a day.</p> <p>[16] In the treatment phase, the patient is on the treatment machine.</p> <p>[18] There is a couch or bench or patient treatment platform.</p> <p>[20] And this platform can move only in a number of parameters, that are based upon the inherent movement of the machine.</p> <p>[23] The couch can move in and out.</p> <p>[24] It can move side to side.</p> <p>[25] It can move up and down.</p>

Page 13

Page 15

[1] The simulation phase image usually
[2] orthovoltage is then matched to a treatment phase
[3] image, which is taken by exposing a film or using
[4] some type of an image capture device underneath
[5] the patient opposite the beam.

[6] And these two films are then matched.

[7] What is important is that the matching for
[8] years certainly in 1993 was carried out by
[9] physicians looking at the two images and saying
[10] "I am on target" or "I am not".

[11] The physician would look at the simulation
[12] film, and then this treatment phase image and see
[13] that he or she was on target.

[14] And then approve the treatment.

[15] One of the problems that was inherent in
[16] this situation was the problem of misalignment.

[17] You can appreciate if the simulation was to
[18] target the tumor and the treatment phase image
[19] was off target, unless this were corrected, you
[20] could do two very bad things.

[21] Miss part of the tumor.

[22] Treat unnecessarily normal tissue.

[23] Or in fact do both.

[24] Miss tumor and treat unnecessarily normal
[25] tissue.

Page 14

Page 16

[1] The more treatment fractions in which the
[2] misalignment occurred, the more we were not
[3] serving the patient as well as we could.

[4] Because we are missing tumor and damaging
[5] normal tissue.

[6] So the problem we had was to automate or
[7] make more efficient this process of hitting the
[8] tumor and missing normal tissue.

[9] We had two problems that had to be
[10] overcome.

[11] The tumors are three dimensional, they are
[12] not flat.

[13] These images are two dimensional. The
[14] other problem is that patients are moving.

[15] Patients are breathing.

[16] They are twitching.

[17] Many of them are sick, coughing, and
[18] although things look good at the time the patient
[19] is set up on the machine, there may be movement.

[20] How do we solve this problem?

[21] Early on, radiation oncologists compared an
[22] image taken during the simulation phase with an
[23] image taken during the treatment phase.

[24] Estimate the differences.

[25] And then manually control for alignment of

[1] the beam.

[2] Move the patient.

[3] Move the beam.

[4] If necessary, go back to the simulator and
[5] repeat the simulation process.

[6] What we found was helpful was to devise a
[7] system using fiducials or markers.

[8] These can be bright spots, reflective
[9] spots, or they can be other types of markers used
[10] as a grid in which the tumor could be estimated
[11] in its position relative to one or more fiducial
[12] markers, either fixed or moving markers during
[13] treatment to allow us to determine if the beam
[14] was on target.

[15] In this setting, one can see here that an
[16] x-ray image taken during the first phase or
[17] simulation phase could be matched to an image
[18] taken during the second phase or the treatment
[19] phase.

[20] This would give a better way of determining
[21] if the radiation oncology treatment was on
[22] target.

[23] Now, computerized image matching was
[24] thought to us back in 1993 as being an ideal way
[25] to enhance this process and eventually be able to

<p>[1] Of course, the disadvantage is you [2] needlessly are treating more normal tissue. [3] Early solutions involved fixing the [4] patient. [5] Now, this might be possible for a head neck [6] cancer patient in which this malleable plastic [7] like material is used to immobilize the head, [8] attached to the treatment couch by vice like [9] design. [10] And a patient's head would not move, tumor [11] target would not move very much. [12] This clearly is impractical in a situation [13] for a tumor in the chest such as a lung cancer or [14] esophagus cancer in which the patient has to [15] breathe. [16] Now, one approach, which we took, was to [17] use a charge couple device, CCD camera, to [18] actually be able to watch the movement of these [19] fiducials. [20] And to be able to track whether the [21] fiducial was in the target or was out of the [22] target. [23] During respiration, these markers could be [24] followed. [25] And the ideal situation, which we thought</p>	<p>Page 17</p> <p>[1] technology involved. [2] Do you have questions? [3] JUDGE ZIEGLER: I have no questions. [4] Thank you, sir. [5] MR. JOHNSON: Then let's -- now, following [6] the sequence, will they proceed with their [7] tutorial, or should I do my opening? [8] JUDGE ZIEGLER: What is your pleasure? [9] MR. SNEATH: I am going to deliver an [10] opening statement. [11] But if you have one -- [12] MR. JOHNSON: I am prepared. [13] JUDGE ZIEGLER: Mr. Johnson, proceed with [14] your opening statement. [15] MR. JOHNSON: You now had opportunity to [16] get a general understanding of the technology. [17] Now I want to focus on two areas. [18] One is just generally what the patents [19] cover. [20] And then two, the law regarding claim [21] construction. [22] Because I think the two in this case go [23] hand in hand. [24] This is -- as you know, is a process to [25] interpret what the claims mean.</p>
<p>[1] of, was to link the data collected by the CCD [2] detector to the machine, so you could turn the [3] machine off, when the cancer moved out of the [4] volume. [5] Turn the machine back on during [6] respiration, when the cancer was in the field. [7] And in fact, this would be a situation in [8] which the cancer is only treated when it is in [9] the field and the respiratory cycle. [10] You can imagine if the beam were on, it is [11] on now, if the beam were on at this point, you [12] would be needlessly treating normal tissue in [13] this area, which is out of the beam. [14] So in summary, the major challenges we had [15] in radiation oncology at that point in 1993 were [16] how to maximize dose to the tumor, minimize dose [17] to normal tissue given two real problems. [18] Cancers are three dimensional and people are [19] moving. [20] And we chose to use the patient as the [21] system by which to monitor where the patient is, [22] not using the bench or not using fixed variables [23] on the couch. [24] MR. JOHNSON: Thank you, Doctor. [25] We have now given you just an overview of</p>	<p>Page 18</p> <p>[1] That interpretation is a matter of law. [2] We have means plus function claims here. [3] Which has a certain meaning. [4] We also have basic standard meaning [5] approaches that you have to take in order to [6] construe these claims. [7] You are aware we have the two patents, the [8] '554 and '431. [9] The '554 covers one aspect of the tutorial [10] as it relates to patient movement. [11] '431 relates to the other aspect of the [12] tutorial, which is the matching of the various [13] images. [14] So if you look at the '554, as you just [15] heard, the issue is how can you avoid basically [16] destroying good tissue while at the same time [17] ensuring you hit the tumor. [18] And solving the problem patient movement. [19] This is patient movement in a number of [20] contexts. [21] Not limited to breathing. It includes any [22] type of patient movement. [23] And you use the fiducials in order to [24] assist you in making that decision. [25] You want to do it using a computer.</p>

Page 21

Page 23

[1] Because the less guesswork you have, the
[2] more precision you will have.
[3] As you just heard Dr. Greenberger say, we
[4] track the patient.
[5] There are other technologies that adjusted
[6] the couch.
[7] But the '554 tracks the patient movement
[8] and therefore enables, we believe, a much more
[9] accurate approach to solving the problem that we
[10] discussed here.
[11] Now, the '431 concerns the problem of
[12] automatically matching various x-ray images with
[13] a reference image.
[14] And the advantage, obviously, is the more
[15] precise the match, the more accurate you are
[16] going to be in terms of your locating of the
[17] tumor.
[18] And you are going to have much better
[19] diagnostic as well as treatment.
[20] Now, claim construction.
[21] Spending a little time on the law in claim
[22] construction, because I think it is important for
[23] you to be focused on exactly what we are talking
[24] about today.
[25] As the court knows, there is a difference

[1] between the claims and the specification. You
[2] will hear a lot about that today.
[3] But the law is very clear.
[4] That the claims define the invention, and
[5] the court has to construe the claims.
[6] Here is an example of what we mean.
[7] We are going to offer construction of
[8] successive.
[9] That is following an order.
[10] Which is basically the general and commonly
[11] understood definition for that term.
[12] You are going to hear Varian's
[13] construction. That is going to include all sorts
[14] of additional items like taking an uninterrupted
[15] sequence during a single radiation treatment.
[16] None of that language is in the claim.
[17] We are here to define those terms.
[18] I want to emphasize two things.
[19] There is a difference between defining the
[20] terms and focusing on function in a means plus
[21] function case.
[22] That we will talk about.
[23] But the terms themselves are given their
[24] common meaning, unless there is some reason to do
[25] otherwise.

Page 22

Page 24

[1] about adding extraneous limitation appearing in
[2] the specification is improper.
[3] We are going to go through a variety of
[4] these issues in the patent specification.
[5] I am not going to go in to them now.
[6] But I will simply say that many of the
[7] claims we are going to be talking about today --
[8] or terms, I should say, are terms that have
[9] commonly understood meaning to someone of
[10] ordinary skill in the art.
[11] And adding terms or trying to rewrite them
[12] in a way that is much different than the actual
[13] language of the claims is improper.
[14] Now, let's talk about a means claim for a
[15] moment.
[16] Means claim simply says that if a claim is
[17] expressed in a means or step, and there is not a
[18] recital of structure or material, then they look
[19] to the specification and drawings to find the
[20] relevant structure and material.
[21] However, if there is sufficient disclosure,
[22] you don't have to look to the specification and
[23] material.
[24] In other words, if the claim has
[25] disclosure, you don't have to look to the

	Page 25		Page 27
[1]	specification.	[1]	court cases here, because they were as a matter
[2]	We will spend a lot of time today talking	[2]	of fact the clearest on the point.
[3]	about means plus function claims and what is	[3]	But they all stand for the same
[4]	included.	[4]	proposition, which is you look -- when the court
[5]	The other point to be made.	[5]	is able to identify an overall structure that
[6]	Again, these are just examples of terms we	[6]	performs a claim function, there is no need to
[7]	are going to go through.	[7]	delve deeper and identify the internal components
[8]	What is a camera means, a display means?	[8]	of that structure.
[9]	Those are issues we will take up.	[9]	Later on we will show you a federal circuit
[10]	But we are going to prove to you that, in	[10]	case where this very principle is applied.
[11]	fact, those really aren't means plus function	[11]	Because what we are going to demonstrate to
[12]	claims.	[12]	you today is that the argument being made, that
[13]	They have a commonly understood meaning to	[13]	every element of an algorithm is part of a claim
[14]	one of ordinary skill.	[14]	is not only wrong, it is unequivocally rejected
[15]	And therefore, we believe that our proposed	[15]	by the federal circuit.
[16]	construction is the proper one.	[16]	Another principle that we are going to go
[17]	Now, because these are means plus function	[17]	through is the exclusion of a preferred
[18]	claims, and we are dealing with computers, one of	[18]	embodiment.
[19]	the issues is when you look at the specification,	[19]	The law is very clear that you can't have a
[20]	you find algorithms.	[20]	claim construction that excludes preferred
[21]	How do you interpret algorithms?	[21]	embodiment, unless there is a very unusual
[22]	And what can you import from the algorithms	[22]	circumstance.
[23]	in to the claims?	[23]	And it would require highly persuasive
[24]	We are going to demonstrate to you that you	[24]	evidence support.
[25]	look at the proposed algorithm, as outlined	[25]	We will demonstrate to you that Varian has
	Page 26		Page 28
[1]	above.	[1]	proposed a claim construction that would exclude
[2]	You have to define the algorithm broadly,	[2]	the preferred embodiment.
[3]	because that is done by the federal circuit.	[3]	That it is totally inconsistent with the
[4]	And you only focus on the appropriate	[4]	claim language.
[5]	structure necessary to carry out the function.	[5]	And I think we will demonstrate to you that
[6]	And we recite the Odetics case, which was	[6]	following the laws as you must, that exclusion --
[7]	not an algorithm case, but is cited in all the	[7]	the attempt to exclude in this case fiducials or
[8]	algorithm cases for the following proposition.	[8]	artificial fiducials is improper.
[9]	Individual components, if any, of an	[9]	Another principle you will have to deal
[10]	overall structure that corresponds to the claimed	[10]	with is the effect of dependent claims.
[11]	function are not claim limitations.	[11]	The dependent claims tend to -- two types
[12]	Rather, the claim limitation is the overall	[12]	of changes.
[13]	structure corresponding to the claimed function.	[13]	There are independent claims and dependent
[14]	Now, in plain English, what that means is	[14]	claims.
[15]	you have to be able to ascertain the overall	[15]	The dependent claims depend from the
[16]	operation being performed.	[16]	independent claim, and they usually focus on a
[17]	And the various individual elements that	[17]	particular area that may or may not have been
[18]	make up that operation in an algorithm are not	[18]	called out -- has not been called out in the
[19]	part of the claim.	[19]	independent claim.
[20]	And we are going to show you case law that	[20]	The fact that there are dependent claims
[21]	directly speaks to that.	[21]	that call out specific structure is evidence that
[22]	One of the issues in this case for purpose	[22]	the patent holder understood and knew what it was
[23]	of this hearing is how -- is addressing that	[23]	doing, when it defined the terms the way it did.
[24]	particular issue.	[24]	It defined the claims the way it did.
[25]	And we cite cases -- we cited some district	[25]	So for example, when we deal with words

Claim Construction Hearing
November 29, 2007

Page 29

Page 31

[1] like fiducials, there are specific dependent
[2] claims that cover certain types of fiducials but
[3] not others.

[4] We will point out or demonstrate to you
[5] under the law, that is evidence that the
[6] exclusionary attempt that will be made by Varian
[7] has to fail.

[8] Finally, there is -- the defendant's brief
[9] talks about use of prior art in claim
[10] construction.

[11] It talks about preserving validity. What
[12] it doesn't talk about is what the law is.

[13] The law is that the doctrine of construing
[14] claims to preserve their validity, a doctrine of
[15] limited utility in any event therefore has no
[16] applicability, because it is only applied in
[17] cases where the claim term is ambiguous.

[18] And the evidence will show -- we will
[19] demonstrate there is no ambiguity as to these
[20] claims.

[21] That the doctrine they are trying to invoke
[22] has no application here.

[23] In summary, we are going to demonstrate to
[24] you that the common ordinary understood plain
[25] meaning of one of ordinary skill in the art

[1] couple of dozen terms here today.

[2] But I am sure we will touch on almost all
[3] of them specifically.

[4] But I want to make a few general points
[5] particularly about claim construction and about
[6] the history of these patents.

[7] This is a classic case, your Honor, of
[8] patents that have very narrow protection.

[9] Very narrow protection on really what are
[10] purely theoretical concepts.

[11] As opposed to real world applications of
[12] these concepts.

[13] Dr. Greenberger's story is compelling.

[14] And motivated, as you can see, by a real
[15] desire to treat patients.

[16] And that is great.

[17] But what we are here to do today is
[18] construe certain terms in these patents, and that
[19] is the real focus of the inquiry today.

[20] They are seeking to enforce these patents
[21] against a company Varian, who in partnership with
[22] UPMC, who employs Dr. Greenberger, have
[23] established a whole number of cancer treatment
[24] centers in this region and beyond using products
[25] from my client Varian.

Page 30

Page 32

[1] really governs this case and should direct the
[2] court in a way in which these claims can be
[3] construed.

[4] You heard from Dr. Greenberger.
[5] Dr. Michael Schell will testify briefly about the
[6] standard of ordinary skill and some of the claim
[7] terms.

[8] That is it.

[9] **JUDGE ZIEGLER:** Thank you, Mr. Johnson.
[10] Mr. Sneath.

[11] **MR. SNEATH:** Thank you, your Honor.

[12] As you know, I represent Varian along with
[13] my colleagues who are here today.

[14] As Mr. Johnson has pointed out, we are
[15] going to be discussing two patents, your Honor.

[16] I will discuss a few very broad concepts
[17] here and touch a little on the history of these
[18] claimed inventions in response to
[19] Dr. Greenberger's opening comments and tutorial.

[20] Both of these patents, the '554 and '431,
[21] your Honor, were applied for in the fall of
[22] 1996.

[23] And were issued in March and July of 1998,
[24] respectively.

[25] We are going to be asking you to construe a

[1] **MR. JOHNSON:** Totally irrelevant to claim
[2] construction.

[3] **JUDGE ZIEGLER:** Overruled.

[4] **MR. SNEATH:** I want to give a little
[5] history, because Dr. Greenberger did that. I
[6] want the same opportunity, if you don't mind. I
[7] appreciate it.

[8] UPMC has partnered, in their words, with
[9] our client to create cancer centers using our
[10] technology the Varian products.

[11] And these have been developed as part of
[12] the backbone of their treatment centers all
[13] around this region.

[14] In stark contrast to that, your Honor, the
[15] Pitt inventors have inventions on paper in these
[16] patents, which have never been commercialized,
[17] never been developed, never been tested
[18] clinically.

[19] And never put in to practice.

[20] And so what is important is that this story
[21] about a desire to have a fully automated computer
[22] controlled system for radiology treatment has
[23] simply not come to fruition in these inventors'
[24] practice.

[25] The story, as you heard, is that there was

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 33		Page 35
<p>[1] an intention to create a fully automated system, [2] where radiation oncologists program in to a [3] computer a treatment plan.</p> <p>[4] And he would then take simulation images, [5] as you heard described, program them in to the [6] computer, match them up with treatment images, [7] and have all of this programmed in to the [8] computer to be done automatically, so that these [9] components, that you saw in the diagrams, the [10] gantry, the couch, the collimator that generates [11] the beam, that all those things controlled by a [12] computer would move automatically to accomplish [13] the very worthwhile goal of treating only tumor [14] and not healthy tissue.</p> <p>[15] That was the intention.</p> <p>[16] Whether due to lack of ability or [17] otherwise, they never achieved that fully [18] automated system.</p> <p>[19] And so what they have in the patents is a [20] far more modest invention.</p> <p>[21] It essentially consists of a pair of [22] computer algorithms that were designed to perform [23] two very narrow functions.</p> <p>[24] The first in the '554 patent is what you [25] heard mention of x-ray matching technology.</p>		<p>[1] every respect, in their proposed constructions, [2] University of Pittsburgh wants to take these very [3] narrow claims, particularly the algorithms, and [4] broaden them.</p> <p>[5] Mr. Johnson cited portions of cases which [6] talk about the broadening of claims.</p> <p>[7] And in every respect, they want and need to [8] broaden these claims in order to snare Varian in [9] an infringement argument. They can only do it by [10] a vast broadening of their claims.</p> <p>[11] They have designated Dr. Greenberger as one [12] of their experts.</p> <p>[13] And as I said, his story is compelling, and [14] he is certainly an expert in his field.</p> <p>[15] But as we know from Markman and other [16] cases, the testimony of the inventors in a claim [17] construction proceeding is entitled to little [18] deference, and as the case law says is of little [19] consequence in these proceedings.</p> <p>[20] You heard mention by Mr. Johnson of means [21] plus function elements.</p> <p>[22] And that is really in large part what is at [23] the heart of the discussion today.</p> <p>[24] He cited examples.</p> <p>[25] And there are numerous ones, where the</p>
	Page 34	Page 36
<p>[1] Second in the '431 patient motion [2] detection.</p> <p>[3] When they did this back in the '90s, they [4] entered a very crowded field because many people [5] had already researched and developed algorithms [6] to do the same functions.</p> <p>[7] And though they like to characterize their [8] invention as unique and revolutionary, all they [9] really contributed were some tweaks on some [10] already known algorithms.</p> <p>[11] And there is no evidence that any of them [12] work or that any of them have ever been put in to [13] practice.</p> <p>[14] So the critical point is that these claimed [15] inventions were narrow.</p> <p>[16] And are limited to the very specific [17] algorithms that these inventors developed in [18] their patents.</p> <p>[19] This is borne out by the way the patents [20] are written, and my colleagues, as Mr. Johnson [21] will do, are going to focus on the language.</p> <p>[22] I am not going to spend time with that now.</p> <p>[23] Because there is plenty of testimony and [24] argument to come.</p> <p>[25] But as you heard Mr. Johnson say, in almost</p>		<p>[1] language says something along the lines of [2] tracking means, tracking movement between [3] successive sets of images and so on.</p> <p>[4] These are means plus function claims.</p> <p>[5] And it is very important to go back to the [6] history of what happened with the Supreme Court [7] of the United States and the development of case [8] law in means plus function for just a brief [9] moment.</p> <p>[10] Back in 1946, the Supreme Court said you [11] can't write -- patent prosecutors can't write [12] claims using means plus function language, [13] because they are attempting to capture every [14] conceivable way to perform a particular [15] function.</p> <p>[16] To use a simple example, your coffee cup, [17] your Honor, if it is described in a patent claim [18] as a cylindrical object with a bottom and a [19] certain width and a certain structure, to hold [20] coffee with a gripping device to raise it up to [21] your mouth to drink, all of those things define [22] the structure in a way that is sufficient.</p> <p>[23] But if a prosecutor wants to say simply a [24] means for holding coffee with a means for [25] gripping said means for holding coffee, they are</p>

Claim Construction Hearing
November 29, 2007

Page 37

Page 39

[1] attempting to capture every conceivable way you
[2] could hold coffee, and the Supreme Court said we
[3] can't do that.

[4] That is too broad. Those claims are
[5] invalid.

[6] So the Congress responded in 1952 by
[7] passing the reform act with 35 USC section 12,
[8] 112, paragraph 6, which is what is at issue here
[9] today, means plus function claims.

[10] So what they have said is means plus
[11] function claims are allowed.

[12] But they are only construed to cover the
[13] corresponding structure, material or acts
[14] described in the specification and equivalence
[15] thereof.

[16] In other words, statute allows them but
[17] makes them by design very narrow.

[18] They are restricted in scope to the
[19] disclosed structure and equivalence.

[20] And if the specification doesn't adequately
[21] describe the structure, then they are invalid.

[22] Now, obviously, means plus function found
[23] its way in to the description of software and
[24] computer inventions as has everything.

[25] In such cases, the courts have held that

[1] Just to give you a brief overview of what
[2] we will do so you know where this is going.

[3] We are going to talk, Matt Poppe, my
[4] colleague, will discuss means plus function case
[5] law in more detail, particularly as it relates
[6] today to computer algorithms.

[7] We are going to call Dr. James Balter as an
[8] expert witness.

[9] He is a professor at University of
Michigan.

[10] He has specialized in computerized x-ray
[11] matching techniques since the 1990's.

[12] He is going to talk about image matching in
[13] the '431 patent.

[14] And he is going to give his opinion
[15] regarding certain claim terms.

[16] Bill Anthony and Matt will present argument
[17] then on the '431.

[18] We are also going to be addressing the '554
[19] patent.

[20] Of course, we have Dr. Steven Jiang here,
[21] who began his career as assistant professor at
[22] Harvard medical school.

[23] He is now director of research in the
[24] department of radiation oncology and a tenured

Page 38

Page 40

[1] the specification must disclose an algorithm that
[2] performs the function identified in the claim.

[3] So you will hear a lot today about these
[4] algorithms. Algorithms are nothing more than
[5] sequence of steps performed by computer software.

[6] So when a patent specification describes an
[7] algorithm using flow charts, as you will see both
[8] in the patents and in the tutorials here today,
[9] there are flow charts in these patents in the
[10] specifications.

[11] Those flow charts constitute the structure.

[12] That defines and limits the patented
[13] invention.

[14] Notwithstanding the discussion about
[15] broadening those, which is the -- what the
[16] plaintiffs are encouraging here today.

[17] So the asserted claims we are going to
[18] prove and argue today must be limited to these
[19] algorithms disclosed in the specifications of
[20] these patents.

[21] Pitt would like you to ignore the case law
[22] and expand them to cover, as we talked about with
[23] the coffee cup, any product that could perform
[24] any of these functions stated in the claims.

[25] And we would argue that is improper.

[1] professor at UC San Diego medical school.

[2] He will testify about the specific
[3] algorithms in the '554 patent and the nature of
[4] the preexisting technologies for developing
[5] detecting patient breathing.

[6] That is really it, your Honor.

[7] That is the overview I wanted to give. I
[8] appreciate your time.

[9] Thank you very much.

[10] **JUDGE ZIEGLER:** All right. You may
[11] proceed, counselor.

[12] **MR. ANTHONY:** My name is Bill Anthony.
I am a patent attorney.

[13] An engineer.

[14] I am not an oncologist, radiation
oncologist.

[15] I suppose the world is a safer place for
that.

[16] If you permit me, I would like to stand by
the board.

[17] **JUDGE ZIEGLER:** Yes, sir.

[18] You may do that.

[19] **MR. ANTHONY:** What I will attempt to do is
to do this chronologically.

[20] I will take you back in time before the

University Of Pittsburgh v.
Varian Medical Systems, INC.,

	Page 41	Page 43
[1]	work of these fellows.	[1] this field.
[2]	In fact, take you back to a time this whole	[2] In fact, a leader in this field.
[3]	radiation oncology business started.	[3] And these linear accelerators that generate
[4]	And then carry you forward to the point	[4] these megavolt beams that kill tumors come out of
[5]	which these claims were allowed or jumping off	[5] the Varian research that preceded World War II.
[6]	part of these inventors and the environment in	[6] The klystron tube.
[7]	which these claims were allowed.	[7] That was invented by the Varian brothers
[8]	Because as a case law shows, it is very	[8] Russell and Sigurd.
[9]	important that you consider what the environment	[9] I can skip through some of this quickly.
[10]	was at the jumping off point when the	[10] And Varian after World War II decided as
[11]	inventions -- alleged inventions were made in	[11] many companies, we have this technology we
[12]	order to construe the claim.	[12] developed for the war, it is used in radar, let's
[13]	So that you don't start construing claims	[13] try to find a good civilian use, something that
[14]	in a way that would just cover what was done	[14] would be beneficial to mankind.
[15]	prior to these inventors.	[15] They decided they would try to use this
[16]	I would like to acknowledge	[16] beam for cancer treatment.
[17]	Dr. Greenberger's excellent presentation.	[17] And that was done by Dr. Edward Ginzton,
[18]	We agree with much of it. Parts of it, of	[18] founder of Varian.
[19]	course, we don't agree with.	[19] The first treatment of cancer using a
[20]	That will be up to our witnesses to	[20] medical linear accelerator, that is the linear
[21]	explain.	[21] accelerator that causes these megavolt x-rays to
[22]	Obviously, what I am going to say is not	[22] be projected in to the body, was conducted in
[23]	evidence.	[23] 1956 at Stanford University hospital, which is
[24]	And so we will disagree with	[24] next door to Varian.
[25]	Dr. Greenberger in part through our witnesses.	[25] We have this young child, a boy of two
[1]	There is a term "fiducial" you will hear	[1] years old.
[2]	over and over again.	[2] And that is the first patient.
[3]	What helps me understand the term is to	[3] That boy had a brain tumor.
[4]	think of the term "fiduciary", something	[4] And he was cured through this Varian
[5]	trusted.	[5] machine.
[6]	And a fiducial is a location that is	[6] That started it all in 1956.
[7]	trusted, that can be trusted in the sense it is a	[7] And this gantry that allows you to project
[8]	very precisely known location in these images.	[8] the beam through at various angles through the
[9]	When you see an x-ray that pops out at you and	[9] patient, as Dr. Greenberger said to minimize the
[10]	the location is precisely known.	[10] exposure of good tissue and maximize the exposure
[11]	You can trust it as a surrogate for the	[11] of the tumor, was done by Varian in 1961.
[12]	tumor.	[12] I will skip to this is pretty much as
[13]	So that when you want to treat a tumor, you	[13] described by Dr. Greenberger, where you can enter
[14]	can have a fiducial that is a trusted location.	[14] the body with these beams at various angles.
[15]	This reference point relative to the tumor, so	[15] And by doing that, of course, you are
[16]	that you can use that to guide your beam, to	[16] limiting the exposure of good tissue. And next
[17]	adjust your beam.	[17] slide.
[18]	When I think of fiducial, it is not a term	[18] I am going to show you through this
[19]	I normally use.	[19] animation how some of that is done.
[20]	In my engineering I don't normally use that	[20] This is the typical radiation treatment
[21]	term.	[21] machine.
[22]	But in this case, fiducial is a medical	[22] You have your gantry, patient.
[23]	term used in these cases or in these devices, and	[23] The patient is lying on a couch, which is
[24]	trusted is what causes me to remember that.	[24] adjustable in many directions.
[25]	Varian is a very significant company in	[25] And you have at the top of the gantry, you

Claim Construction Hearing
November 29, 2007

Page 45

Page 47

[1] will have an x-ray source, megavolt x-ray
[2] source.

[3] At the bottom an imager. That thing can
[4] rotate around the patient.

[5] Now, one of the important aspects is the
[6] way in which this beam is formed.

[7] And we see that it is formed through a
[8] treatment portal.

[9] This is a doorway through which the beam
[10] passes.

[11] And what is significant about that is that
[12] that doorway can be changed in configuration.

[13] As Dr. Greenberger said, the tumor is three
[14] dimensional, so when you look at it from
[15] different directions, it will have a different
[16] shape.

[17] And now there are these movable leaves in
[18] this doorway.

[19] Here is the doorway.

[20] There are movable leaves.

[21] We can adjust those leaves to configure the
[22] doorway to match the shape of the tumor at any
[23] particular angle.

[24] And then we project the beam through that
[25] doorway in to the patient.

Page 46

Page 48

[1] And hit the tumor.

[2] Now, that doorway can be changed.

[3] Normally, this would rotate first, for
[4] simplification we haven't done that.

[5] But you see the doorway changes.

[6] So on each rotation, you have a different
[7] shape of the three dimensional tumor.

[8] And you will change the doorway.

[9] The portal through which that beam is sent.

[10] That forms the beam.

[11] Now, careful planning is required
[12] obviously.

[13] You can think of this like a surgical knife
[14] or something that is going to do harm, if you
[15] send it in the right place.

[16] And therefore, the physician, a person
[17] comparable to Dr. Greenberger, determines the
[18] exact location, size and shape of the tumor.

[19] Dr. Greenberger, and this will come out in
[20] the testimony, then passes on to a medical
[21] physicist, because now you know where the tumor
[22] is and what its shape is, now you have to do a
[23] lot of engineering to plan the treatment.

[24] And a medical physicist takes over from the
[25] oncologist and determines the angle of the

[1] radiation beam.

[2] The dosage from each angle.

[3] Including this intensity and duration and
[4] the shape of that portal.

[5] And finally programs the treatment
[6] procedure.

[7] Next slide.

[8] Now, often a simulator is used. Not
[9] always. Often a simulator is used in order to
[10] try out, if you will, the treatment before the
[11] treatment occurs.

[12] And the simulator now will send a lower
[13] energy, a kilovolt energy beam through the
[14] patient among the same directions as the
[15] treatment will ultimately be performed.

[16] And so the simulator has some familiar
[17] components.

[18] It generates an x-ray beam. This is
[19] kilovolt, not megawatt.

[20] Dr. Greenberger said kilovoltage used for
[21] treatment.

[22] But I think you will hear from the
[23] witnesses, not so in these imaging systems.

[24] And it has the gantry, couch, imager. So
[25] it mimics the treatment equipment.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 49

Page 51

[1] Send another beam through the patient.
[2] Move the gantry.
[3] Send another beam through the patient.
[4] That is the point at which all of these beams converge.
[5] That is where the tumor should be.
[6] That is why we are going to use fiducials and other things as we will see later.
[7] Each of those beams is simulated.
[8] And an image.
[9] This high quality image is taken at each treatment position in the simulator.
[10] Next slide.
[11] And every millimeter counts, obviously.
[12] And this Dr. Greenberger touched on.
[13] Let me just say the real problem is when that patient is on the treatment machine, the tumor can't be visualized.
[14] It is typically inside the body.
[15] There is no way for a doctor or a medical physicist to visualize that tumor.
[16] You are working with a dangerous instrumentality.
[17] The megawatt beam is potent. It kills cells.

[1] in the first instance at start of treatment.
[2] And now I will take you up to the point, the jumping off point with these inventors.
[3] As you might expect, it has been long recognized, remember in 1961 we started moving these gantries around, Varian did, with its equipment.
[4] So it has been known for a long time since at least 1961.
[5] And actually, probably back to 1956 you must accurately position the patient.
[6] And so the issue of matching simulation images and portal images to position the patient has been around for a long time.
[7] At least in the 1980's the notion of using computers to match has been disclosed in prior art.
[8] That was prior art before the patent office examiner.
[9] When this was allowed, examiners said yes, here is a lot of scientists coming up with algorithms for computer matching of these high megavolt range bad portal images and these kilovolt range good simulation images.
[10] So that has been done since the '80s, that

Page 50

Page 52

[1] And the patient may move.
[2] You have to worry about that.
[3] So you have some positioning problems.
[4] One is you have to get the patient in the right position at the start of the treatment.
[5] You need to maintain that proper position during treatment.
[6] We saw these restraints in Dr. Greenberger's presentation.
[7] Those restraints are still used with today's equipment.
[8] That problem has never gone away. I think there was suggestion that the invention somehow avoids those restraints. No, they are still used.
[9] And then you have to detect in response to movement that occurs after you set up the patient on the table. You get the patient in the right position.
[10] And yes, patient is sick, could cough.
[11] There could be voluntary, involuntary motions.
[12] You have to detect those and respond appropriately.
[13] So let's take the first problem.
[14] Putting the patient in the proper position

[1] was before the examiner.
[2] There is general principles applied.
[3] You look for things that stand out in both of those images.
[4] That is very important, because the portal image is not a good quality.
[5] You have to determine these -- the location of these features, not only relative to the tumor, but relative to the treatment equipment as well.
[6] And so you have a huge geometric problem, which scientists have been confronting long before these inventors came along and have been using computers to solve that problem.
[7] And by determining these relationships, you determine how the patient should be positioned on the table. You check to make sure the patient is properly positioned.
[8] Now, in the '431 patent, and this now is the image matching patent, the examiner cited three prior art references.
[9] We will discuss these through our witnesses.
[10] So you will have testimony as to what these references say.

Claim Construction Hearing
November 29, 2007

Page 53

Page 55

[1] Evidence as to what these references say.
[2] One was Young.
[3] We will show you a quick quote from each of
[4] these.
[5] And remember the problem here is because
[6] portal images are poor.
[7] Because they are done with megavolt x-rays.
[8] And simulation images are good.
[9] If you had two good images, there is no
[10] problem.
[11] No one will say there is an invention in
[12] matching two good images taken by the same
[13] machine.
[14] The problem is two different machines.
[15] Two different quality images.
[16] Taken from different -- in different
[17] spacial relationships.
[18] So Young, et al. is trying to solve that
[19] problem using computer and discusses an
[20] algorithm, that is perfectly appropriate, to
[21] match the poor and good images.
[22] Let me bring you back to the kilovolt
[23] images.
[24] Two kilovolt images is not the problem.
[25] It is the megavolt image, portal image and

[1] This is exactly the objective of these
[2] inventors.
[3] Automated alignment by matching the portal
[4] and simulation images.
[5] That was all before the patent office.
[6] That is the jumping off point for claim
[7] construction.
[8] Next slide.
[9] So '431 patent is not any algorithm for
[10] matching portal and simulation images.
[11] But their particular algorithm. That is
[12] how it is claimed.
[13] So if we look at what is in there, let's
[14] step through.
[15] There is a lot of hardware, all standard
[16] hardware.
[17] I don't think there is any contention this
[18] hardware is somehow new and novel.
[19] What is new and novel, obviously, will be
[20] standard -- is the algorithms.
[21] The hardware is all old stuff.
[22] I don't think there will be any contention
[23] to any other effect.
[24] It is the algorithm.
[25] Now, here we are going to show you how a

Page 54

Page 56

[1] the kilovolt simulation image.
[2] Also before the patent office, in fact,
[3] this was a reference that caused the patent to be
[4] withdrawn from issuance.
[5] And amended in order to come up with
[6] allowable patent.
[7] And that is McParland.
[8] It is very objective to do exactly what we
[9] have been talking about.
[10] Have an algorithm, extremely fast and
[11] accurate algorithm for registering digital portal
[12] and simulation images.
[13] There is your algorithm.
[14] So the examiner is sitting there.
[15] There is algorithms for doing this image
[16] matching.
[17] And then Radcliffe is another cited in the
[18] patent office before the examiner.
[19] Examiner is presumed to be aware of these.
[20] And certainly there is prosecution history
[21] that suggests he is aware of these.
[22] And here, a new image alignment algorithm,
[23] pseudocorrelation has been developed.
[24] The algorithm is well suited to the task of
[25] automated alignment.

[1] simulation image is created.
[2] And then a portal image.
[3] We will show you the problem the algorithms
[4] are designed to solve.
[5] Here is the simulator.
[6] This is not the treatment machine. This is
[7] the simulator.
[8] We show the patient, we will show some
[9] anatomical features including wind pipes and
[10] lungs.
[11] There is a tumor right there.
[12] And so we are going to take a simulation
[13] image of this patient.
[14] But to do that, we put some trusted
[15] locations here.
[16] These x-ray opaque fiducials.
[17] We know when we put those on what their
[18] location will be relative to the -- when we put
[19] them on, we will determine what their location is
[20] relative to the tumor by taking this kilovolt
[21] high quality simulation image.
[22] So when we take that image, and we look at
[23] the film, or in this case electronic imager, we
[24] have those three spots, they pop out at you.
[25] Then there is a tumor, which is hard to

	Page 57	Page 59
<p>[1] visualize in this.</p> <p>[2] But in the actual x-ray a professional</p> <p>[3] could see the tumor.</p> <p>[4] So there is a tumor there.</p> <p>[5] Now because of that, we have a known</p> <p>[6] relationship between those fiducials, so they</p> <p>[7] serve as a surrogate for the tumor.</p> <p>[8] This is the treatment machine.</p> <p>[9] This is the megavolt x-ray image.</p> <p>[10] It is going through the portal and taking a</p> <p>[11] portal image down here.</p> <p>[12] This is the portal image being formed down</p> <p>[13] here.</p> <p>[14] That is a terrible image by comparison.</p> <p>[15] Dr. Greenberger pointed that out.</p> <p>[16] The fiducials come through strong.</p> <p>[17] You might see the tumor, because this is a</p> <p>[18] terrible image.</p> <p>[19] But these fiducials let the equipment know</p> <p>[20] where the tumor is.</p> <p>[21] Because there is a known relationship you</p> <p>[22] figured out using the simulation image.</p> <p>[23] These two images are taken in different</p> <p>[24] perspectives, by different machines.</p> <p>[25] And they need to be corrected.</p>	<p>[1] So it is those effects, translation,</p> <p>[2] rotation scales, skew, deformation, that these</p> <p>[3] algorithms are trying to accommodate.</p> <p>[4] And that is very, very clear, that this</p> <p>[5] patent is directed to solving that problem.</p> <p>[6] It has algorithms for solving the problem</p> <p>[7] of those image mismatch factors.</p> <p>[8] And one key thing in this algorithm in</p> <p>[9] distinguishing -- this is the file history.</p> <p>[10] This is an argument being made by the</p> <p>[11] applicant's lawyer to the patent office examiner</p> <p>[12] to get the patent allowed.</p> <p>[13] And they are dealing with McParland, which</p> <p>[14] had an algorithm for matching portal images and</p> <p>[15] simulation images.</p> <p>[16] And he says, "Yes, but our algorithm is</p> <p>[17] better.</p> <p>[18] "Our algorithm doesn't require the input of</p> <p>[19] identification or information in the images such</p> <p>[20] as the anatomical match points required by</p> <p>[21] McParland. So our algorithm is better."</p> <p>[22] So today we will look at what is this</p> <p>[23] algorithm through our witnesses.</p> <p>[24] Our witnesses will testify. What is the</p> <p>[25] algorithm that does that?</p>	
<p>[1] They need to be rotated one with respect to</p> <p>[2] the other, translated, moved left, right, up and</p> <p>[3] down.</p> <p>[4] And finally, there may even be need for</p> <p>[5] scaling.</p> <p>[6] That is these things are not spaced apart</p> <p>[7] the same amount.</p> <p>[8] You have to move up and down.</p> <p>[9] Expand one image relative to the other to</p> <p>[10] bring it to the same scale.</p> <p>[11] And our experts will talk about the</p> <p>[12] algorithms in the patent for doing that.</p> <p>[13] And those motions can be accommodated.</p> <p>[14] Those differences in the images can be</p> <p>[15] accommodated by correspondingly moving the</p> <p>[16] patient. You can rotate the patient as the</p> <p>[17] patient is on the bed.</p> <p>[18] The platform.</p> <p>[19] You can translate the patient, move it to</p> <p>[20] the side.</p> <p>[21] Forward.</p> <p>[22] Head forward.</p> <p>[23] And you can also adjust the height of that</p> <p>[24] bed, that platform, so that you can adjust the</p> <p>[25] scale.</p>	<p>[1] That is what this patent is directed to.</p> <p>[2] And part of knowing -- you can match a</p> <p>[3] portal image with a simulation image for patient</p> <p>[4] positioning.</p> <p>[5] You can also match two portal images.</p> <p>[6] You already have the patient properly</p> <p>[7] positioned in the equipment, in the treatment</p> <p>[8] machine.</p> <p>[9] Now you can match successive portal images</p> <p>[10] and track patient movement.</p> <p>[11] So you can watch the patient.</p> <p>[12] It is like taking an x-ray video, so</p> <p>[13] instead of seeing an image of a person moving</p> <p>[14] across the room or something like that, this is</p> <p>[15] an x-ray video, where you can see the skeleton or</p> <p>[16] the x-ray image of the patient, the patient</p> <p>[17] moving through those.</p> <p>[18] That is done by instead of comparing a --</p> <p>[19] the portal image with the earlier taken</p> <p>[20] simulation image, you compare successive portal</p> <p>[21] images.</p> <p>[22] That is one other feature in the second</p> <p>[23] feature of the '431 patent.</p> <p>[24] Next slide.</p> <p>[25] Now, before you can do this algorithm, as</p>	Page 60

Page 61

Page 63

[1] we have shown in the earlier step, you have to place fiducials on the patient's body.
[2] And so that is the starting point, the trusted reference points that will allow you, even though you are working with a terrible image in the end, the portal image, you still know where that tumor is, because you have surrogates.
[3] So you place those x-ray fiducials on the body.
[4] And they are going to show up in the same place.
[5] You want to, in order to align these two images after you have the -- the portal and the simulation image, you are going to use those to line the images by steps, which will include placing, modifying one image, so that the two images of the fiducials are about the same.
[6] And there is nothing in the '431 patent how you match portal and simulation images other than using fiducials.
[7] It is all about the fiducials.
[8] And there are three basic steps.
[9] Our witnesses will take you through these in some detail.
[10] Coarse alignment.

[1] movement.
[2] And that is that second feature of the '431 patent, which is taking a rapid series of successive portal images to provide this x-ray video so can you watch it. It looks like watching a TV.
[3] But it is the skeletal image you see.
[4] Now, this process is called tracking.
[5] So when you do successive portal images, and you do it quickly enough, you can watch this movement, you can track.
[6] Tracking of course means that you pay attention to -- you do something to track.
[7] You can't be just measuring it.
[8] You have to do something to track.
[9] Let's get to the second patent, which is periodic patient movement.
[10] This is the '554 patent.
[11] That is movement during treatment.
[12] And we are going to illustrate that problem.
[13] I think Dr. Greenberger illustrated it as well.
[14] This is a different way to show it.
[15] Here is the tumor.

Page 62

Page 64

[1] And then prepare for fine alignment.
[2] And finally fine alignment.
[3] That is in the algorithm that accomplishes this goal set forth in the '431 patent that purportedly distinguishes the prior art.
[4] Let's go on to the next.
[5] And after do you these three steps, which will be described by our witnesses, the images can be displayed, the physician can look at them.
[6] Or medical physicist can look at them.
[7] Or you can use them for tracking by looking at successive portal images.
[8] And this is the specific algorithm. Our expert will take care of that.
[9] The second problem is after you get the patient all aligned on the treatment machine, what if the patient moves and we have to accommodate that?
[10] There are two types of movement. One is sudden movement, cough, patient voluntarily, involuntarily moves, such as sit up.
[11] And periodic movement, which is somewhat predictable, such as breathing or heart beats.
[12] And '431 patent says it is matching algorithms can be used to address patient

[1] The patient is breathing in and out.
[2] And his chest is expanding and contracting.
[3] And since this is a tumor on the lung, and the lung is inflating and deflating, that tumor is moving around.
[4] And that is the problem.
[5] How do you make sure you treat just the tumor and not the good tissue?
[6] And this is the surrogates.
[7] We are going to put these fiducials, so we know where that tumor is relative to the fiducials.
[8] Now we can watch the fiducials move.
[9] We know a relationship between movement of the fiducials and movement of the tumor, and we can act quickly and accurately based on that relationship.
[10] That relationship we figure out and send the signal to turn the radiation beam on or off.
[11] Or to warn.
[12] So now in 1954, so I am going now to the jumping off point for the second patent.
[13] As I discussed earlier, there was a jumping off point for the first patent, the image matching patent where a number of scientists had

	Page 65	Page 67
[1] come up with image matching algorithms. [2] And now we are going to the jumping off [3] point for the second patent. [4] This is the movement, accommodating [5] movement. [6] Once again, this was a known issue. [7] And a number of scientists had proposed [8] solutions. [9] Including using light type fiducials to [10] paint a light picture on a patient with laser. [11] And that would become the surrogate. [12] A video camera would look at the light [13] images painted on the body of the patient by the [14] laser. [15] And would sense the movement of the lights [16] relative to the body. [17] And then send signals to the x-ray [18] equipment, the linear accelerator to turn it off, [19] whenever the tumor moved outside the beam. [20] So that concept, almost not quite a decade [21] before the inventors. [22] These were, I think Mr. Johnson said, what [23] we are doing is looking at the patient to detect [24] this movement and respond to it. [25] And these all look at the patient to detect	[1] beam. [2] And one was to measure the volume of the [3] chest using a strain gauge, put something across [4] the chest, that when the chest expanded, it would [5] expand the strap. [6] When the strap expanded, it says okay, you [7] are inhaling. [8] When it contracted, you are exhaling. And [9] would use that to measure movement of the body. [10] Also in the prior art things for measuring [11] air flow through the patient's mouth, because [12] that was an indicator of breathing. [13] That is actually a pretty decent process, [14] that as University of Pitt found out. The [15] technical term is spirometer. [16] Finally, you measure breathing also by [17] putting an electronic or electrical temperature [18] gauge and measure the hot air coming out of the [19] patient's chest. [20] So that is all -- some of the jumping off [21] point. [22] So now just as the '431 patent said, this [23] stuff has all gone on before, but we have [24] something new. [25] It is a new algorithm.	
[1] this movement and respond to it. [2] And so here is another one, the Beroni [3] article, just prior to the work of these [4] inventors. [5] Here they have two kinds of fiducials. [6] They have a fiducial similar to the earlier [7] reference, which is an image, light image painted [8] on the body by a laser. [9] But also it allows the use of artificial [10] fiducials. [11] These x-ray -- not x-ray opaque but things [12] that would show up to a camera. [13] So you see in the image from that article, [14] both types of fiducials, the artificial which [15] are on the skin. On the patient. [16] And the video camera. And say we can use [17] either of those or both of those. [18] Two video cameras look at it, capture [19] movement. [20] And then the software would process that. [21] And then use that to turn the x-ray beam [22] off, whenever the tumor got outside the beam. [23] So another piece of prior art. [24] So these were known ways of doing this to [25] measure the movement of the patient, turn off the	[1] And once again, in the claims, there is a [2] whole bunch of hardware. [3] And no one is going to argue, I don't [4] believe, that any of this hardware is [5] particularly novel, computers, keyboard, CCD [6] cameras. [7] What is the essence of this patent, what is [8] described in detail, just like in the '431 patent [9] is the algorithm. [10] The algorithm that supposedly performs this [11] result. [12] That algorithm will be explained by our [13] experts. [14] The '554 patent says this algorithm is [15] superior to the prior art. [16] Because it detects and tracks movement [17] under varying light conditions. [18] One of the things they are trying to do [19] here is use ambient light, which gets brighter or [20] darker depending on people that move in front of [21] lights. [22] The gantry moving back and forth in front [23] of lights. [24] They said we don't need a special light [25] source.	Page 68

Page 69

Page 71

[1] We have an algorithm that will accommodate
[2] these variations in light sources. Or the
[3] ambient light.
[4] And their algorithm improves speed of
[5] fiducial tracking.
[6] If you will do this, you better be right.
[7] You better be accurate in timing when to
[8] turn that beam off.
[9] So you need to have a high speed tracking.
[10] And they said their algorithm does that.
[11] And enables tracking with as few as one
[12] camera and one fiducial.
[13] These are all of the claims this patent
[14] made to convince the examiner their algorithm was
[15] better than the prior art.
[16] And finally, generates gating signals,
[17] first provides a warning.
[18] Sort of like a yellow light and a stop
[19] light system.
[20] Then of course, once you get too far, it
[21] turns off the beam.
[22] It is a red light.
[23] And there is the statement, column 2, lines
[24] 4 and 8 of that particular effect of their
[25] algorithm.

[1] going to be asked to construe what is a camera.
[2] You are being asked to construe what are natural
[3] or artificial fiducials.
[4] And those are the claims -- the terms that
[5] the other side said needed interpretation.
[6] And in the abstract, it talks about a
[7] camera.
[8] And one of the arguments we are making is a
[9] camera is well known and understood.
[10] The other side makes arguments about what
[11] are or are not fiducials.
[12] And as you can see, both natural and
[13] artificial fiducials are disclosed as part of the
[14] patent.
[15] Now, you just heard that this patent is all
[16] about an algorithm.
[17] If you will, I would like you to take a
[18] look at column 1.
[19] Column 1 defines -- gives you a clear
[20] description of what the patent covers.
[21] And what it says, if you go down to lines
[22] 29 through 47, it says, "In addition to patient
[23] movement, which would cause the tight beam to
[24] miss the tumor, it is important to be able to
[25] detect patient movement, which could cause a

Page 70

Page 72

[1] And that is it, your Honor.
[2] Thank you for your attention.
[3] **JUDGE ZIEGLER:** Thank you, Mr. Anthony.
[4] **MR. JOHNSON:** You just heard this patent is
[5] all about an algorithm.
[6] I am going to address what I consider to be
[7] the argument and the comments in the opening
[8] later.
[9] My client is effectively called a troll.
[10] We will deal with that in our closing.
[11] But I would like to at this point focus on
[12] what we are here today to determine.
[13] And that is what these claims mean based
[14] upon what is stated in the patent.
[15] So if we will, let's look at the '554.
[16] Because we don't have to guess what this
[17] patent is about.
[18] We are told.
[19] If you look at the abstract.
[20] Right at the outset, it makes it clear
[21] that -- it talks about a camera generates digital
[22] image signals representing an image of one or
[23] more natural or artificial fiducials on a patient
[24] positioned on treatment or diagnosis equipment.
[25] The reason that is important, is you are

[1] collision between the patient and the linear
[2] accelerator, which is repeatedly repositioned to
[3] establish the multiple treatment beams."
[4] In other words, detection is important.
[5] And then they describe exactly what it is
[6] they are trying to get from the patent office.
[7] And they say there is a need therefore for
[8] an apparatus.
[9] An apparatus is not an algorithm.
[10] "For detecting patient movement on
[11] radiological treatment and diagnostic equipment,
[12] there is a particular need for such apparatus,
[13] which can detect submillimeter patient movement
[14] in real-time.
[15] "There is also a need for such apparatus,
[16] which can detect patient movement initiated from
[17] various treatment positions.
[18] "There is also a need for such apparatus,
[19] which can detect patient movement under varying
[20] lighting conditions.
[21] "There is a further need for such apparatus
[22] which can discriminate movement associated with
[23] patient breathing from other movement and
[24] accommodate therefore."
[25] That is what they were seeking from the

<p>[1] patent office.</p> <p>[2] And the prior art that was cited did not encompass what was being sought in this patent issue.</p> <p>[3] In the summary of invention, it says,</p> <p>[4] "These needs and others are satisfied by the invention which is directed to apparatus responsive to movement of a patient which identifies and tracks movement of at least one passive fiducial on the patient."</p> <p>[5] It gives you a general description of what the patent says.</p> <p>[6] Not what the argument is.</p> <p>[7] If you look over on column 2, scroll down to about line 12.</p> <p>[8] It says, "As yet another aspect of the invention, the means determining movement of the passive fiducials includes means detecting movement associated with patient breathing and random movement.</p> <p>[9] "The movement associated with patient breathing can be used to generate a gating signal synchronized to patient breathing.</p> <p>[10] "This gating signal can then be used to actuate the beam generator only during selected</p>	<p>[11] If you look carefully at the parts of their quoting, those parts aren't in the claims.</p> <p>[12] That is not what is being claimed in the patent.</p> <p>[13] The claims are at the end of the patent.</p> <p>[14] The quotes are taken willy nilly from throughout the patent specification.</p> <p>[15] So that is not what is being claimed.</p> <p>[16] Dr. Schell, are you ready?</p> <p>[17] JUDGE ZIEGLER: Do you want witnesses sworn?</p> <p>[18] MR. ANTHONY: Yes.</p> <p>[19] (Witnesses sworn.)</p> <p>[20] JUDGE ZIEGLER: Your name, sir.</p> <p>[21] THE WITNESS: Michael Schell.</p> <p>[22] MICHAEL SCHELL</p> <p>[23] Called as a witness by the plaintiff, having been first duly sworn, was examined and testified as follows:</p> <p>[24] DIRECT EXAMINATION</p> <p>[25] BY MR. ZELE:</p> <p>[26] Q Dr. Schell, would you introduce yourself?</p> <p>[27] A I am the director of medical physics at University of Rochester.</p> <p>[28] I have been in that position for 16 years.</p>
<p>[1] parts of the breathing cycle."</p> <p>[2] This is what the inventors thought that they were inventing, what the patent office thought it was allowing.</p> <p>[3] And what we are going to do is demonstrate to you that following the law, as you must, and looking at what is claimed in the specification, what is written, that the terms that we define, as we define them, are proper and appropriate.</p> <p>[4] At this time, I would like to have -- I would like to turn it over to my partner, to enable him to proceed with Dr. Schell, who will discuss for you the issues you need to decide.</p> <p>[5] One, what constitutes the standard of one of ordinary skill in the art, in connection with this patent.</p> <p>[6] And two, how would one understand those claims to be construed.</p> <p>[7] That is different from arguing about other issues concerning how the patent works, which is not before you at this time.</p> <p>[8] MR. ZELE: I just want to follow up with what Dan was saying.</p> <p>[9] There were terms I saw in some slides that talked about the patent claims something.</p>	<p>[10] My educational experience is bachelor's degree at State University of New York at Stonybrook.</p> <p>[11] Subsequent to the bachelor's degree, I was conscripted in to the army.</p> <p>[12] I served at Walter Reid Army Institute of Research in a radio protective drug screen program.</p> <p>[13] After that, I matriculated at the University of Kentucky.</p> <p>[14] Took the core courses for Ph.D. in nuclear physics.</p> <p>[15] And performed a fast neutron scattering experiment off of some rare earth isotopes.</p> <p>[16] I elected to move on, because there weren't positions in nuclear physics.</p> <p>[17] Q Could you tell me what you do at University of Rochester?</p> <p>[18] A I have three functions that most medical physicists do.</p> <p>[19] That is patient care.</p> <p>[20] Teaching.</p> <p>[21] And research.</p> <p>[22] I have been involved with introducing new techniques, including stereotactic radio surgery with the brain and the body.</p> <p>[23] I also administer the group to make sure</p>

[11] things are running smoothly and are faced with
 [12] entities like the state of New York, when they audit
 [13] us or JACO.

[14] **Q** Do you work with equipment, radiation
 [15] therapy equipment on a daily basis?

[16] **A** Yes.

[17] I assist with taking care of the quality
 [18] assurance of linear accelerators, which are all made
 [19] by Varian.

[20] And we have electronic portal imagers on a
 [21] subset of the system.

[22] The system has seven Linax right now.

[23] **Q** Are you a member of any professional
 [24] associations?

[25] **A** I belong to American Association of
 [26] Physicists and Medicine.

[27] The American College of Medical Physics.
 [28] And ASTRO.

[29] And American College of Radiology.

[30] I was elected to fellow membership in the
 [31] AAPM several years back.

[32] And a fellow member of the American College
 [33] of Medical Physics last May.

[34] **Q** What does it mean to be a fellow of these
 [35] organizations?

[11] computer program in the last ten years, sir?

[12] **A** True.

[13] **Q** And you have not written any software for
 [14] imaging applications?

[15] **A** That's true.

[16] **Q** And you have never attempted to write a
 [17] commercial software application any of kind?

[18] **A** True.

[19] **Q** And you don't know which programming
 [20] languages are typically used by persons of ordinary
 [21] skill in the art in 1996?

[22] **A** Well, in that era, it could have been C or
 [23] FORTRAN, among other languages.

[24] **Q** You are not a C programmer?

[25] **A** No.

[26] I am not.

[27] **Q** You don't know whether they used FORTRAN at
 [28] that time?

[29] **A** Well, who is they?

[30] **Q** A person of ordinary skill in the art in
 [31] 1996.

[32] **A** Well, I used FORTRAN myself.

[33] But for other purposes.

[34] Not for image analysis.

MR. ANTHONY: No further questions.

[1] **A** It is generally a recognition of past
 [2] achievements and contributions to the field.

[3] **Q** Do you have any certifications?

[4] **A** I am board certified by American Board of
 [5] Radiology, 1980.

[6] **Q** Have you any publications?

[7] **A** I have on the order of about 69 refereed
 [8] publications in the literature.

[9] Some book chapters among other things.

[10] **Q** We would like to move to admit

[11] Dr. Schell --

[12] **JUDGE ZIEGLER:** Any questions?

[13] **MR. ANTHONY:** Yes, your Honor.

[14] I will skip voir dire -- no. Let me voir
 [15] dire, your Honor.

[16] CROSS EXAMINATION EN VOIR DIRE

[17] **BY MR. ANTHONY:**

[18] **Q** Dr. Schell, my name is Bill Anthony.

[19] I am an attorney representing Varian. We
 [20] haven't met before.

[21] But good morning to you, sir.

[22] **A** Good morning.

[23] **Q** Let me ask you just a few things on your
 [24] background.

[25] You don't recall whether you have written a

[1] **JUDGE ZIEGLER:** All right.

[2] Your motion is granted, sir. You may
 [3] proceed.

[4] DIRECT EXAMINATION (Resumed.)

[5] **BY MR. ZELE:**

[6] **Q** Dr. Schell, did you review the '554 patent?

[7] **A** Yes, I did.

[8] **Q** Did you form an opinion as to the level of
 [9] ordinary skill in the art with respect to '554 patent?

[10] **A** My view is that ordinary skill of the art
 [11] would be MS medical physicist with about five years
 [12] experience, or radiation oncologist with the
 [13] assistance of a software programmer.

[14] **Q** Did you review the '431 patent and its
 [15] prosecution history?

[16] **A** Yes.

[17] **Q** Did you form an opinion as to the level of
 [18] one with ordinary skill in the art --

[19] **A** A Ph.D., medical physicist with five years
 [20] experience, or a radiation oncologist with a
 [21] programmer with a master's degree.

[22] **Q** With respect to the '554 patent, did you
 [23] form an opinion as to the meaning of the term "camera"
 [24] in claim 20?

[25] **A** My view is the camera is simply a device,

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 81

[1] which captures the image of the patient.
[2] It is not in a means plus function format.
[3] Q Why do you believe it is not a means plus
[4] function format?
[5] MR. ANTHONY: Objection. Requires legal
[6] conclusion.
[7] JUDGE ZIEGLER: Overruled.
[8] You may answer.
[9] Q Question is: Why do you believe the camera
[10] is not a means plus function format?
[11] A The camera is simply a physical device to
[12] acquire the images. Not part of any innovative
[13] process or algorithm.
[14] It is readily available at the time of the
[15] patent.
[16] Q In 1996, did people know how to buy
[17] cameras?
[18] A Probably from 1980 when George Eastman
[19] developed a portable film camera.
[20] Q In connection with the '554 patent, is the
[21] term camera limited in any sense to a particular
[22] portion of the spectrum?
[23] A No.
[24] Past use of the cameras was either
[25] invisible spectrum or the infrared.

[1] "digitizer"?
[2] A A digitizer is a device that acquires,
[3] transforms an analog image in to a digital format that
[4] can be used by computer software.
[5] Q Could you give me examples of digitizers
[6] used in 1996?
[7] A Well, in the '70s, digitizers not in this
[8] context were used to hand digitize patient contours in
[9] to treatment planning computers.
[10] At the time of the patent, there were film
[11] digitizers, whether they are laser digitizers or using
[12] visible light to digitize radiographs in to a digital
[13] format.
[14] There is also frame grabbers you can
[15] purchase to interface with a camera to convert the
[16] output of the camera in to a digital format.
[17] Q In 1996, were people able to buy
[18] digitizers?
[19] A It was an easily -- Vidar scanners were
[20] available. Matrox frame grabbers were easily
[21] available.
[22] Nothing unusual.
[23] Q Were those known to one with ordinary skill
[24] in the art?
[25] A Yes.

Page 82

[1] Q Could you give examples?
[2] A Well, the example that I have been using
[3] for since 2000, but it was invented in the late
[4] 1990's, is brain lab radio surgery system for body
[5] radio surgery.
[6] Which is looking at radio-opaque fiducials
[7] that are placed on the patient, but in the patient
[8] setup stereotactic localization is illuminated with
[9] infrared light.
[10] The infrared light is filtered to reduce
[11] noise of the background.
[12] Q Was there anything in that '554 patent
[13] prosecution history that caused you to believe that
[14] the camera is not limited to a particular part of the
[15] spectrum?
[16] A Well, there is evidence in the patent
[17] history of previous patents using cameras with
[18] infrared light and visible.
[19] MR. SNEATH: Could you keep your voice up?
[20] I am having a hard time hearing.
[21] THE WITNESS: I am sorry.
[22] MR. SNEATH: Remember. He is taking it all
[23] down.
[24] Q With respect to the '554 patent, did you
[25] form an opinion as to the meaning of the term

[1] Further, with respect to the '554 patent,
[2] did you form an opinion as to the meaning of the term
[3] "fiducial"?
[4] A Well, fiducial is simply a marker. Pure
[5] and simple.
[6] Q What does it do?
[7] A It is an identification point that one can
[8] use either on a patient or any image that allows you
[9] to track or identify the position of the object in 3D
[10] space.
[11] Q And claim 21 of the '554 patent uses the
[12] phrase "at least one fiducial on the patient".
[13] Did you form an opinion as to the meaning
[14] of that term?
[15] A Well, it is possible within the patent
[16] designed to use one fiducial marker or an array of
[17] markers.
[18] There is no difficulty.
[19] Q Does there have to be any -- does '554
[20] patent require any special relationship between
[21] fiducials?
[22] A No.
[23] The patent allows for either rigid
[24] relationship between the fiducial markers, if there is
[25] more than one.

Page 85

Page 87

[1] Or it allows the markers to be flex in
[2] space.

[3] There is no restriction.

[4] Q Let's then turn to the '431 patent.

[5] Did you form an opinion as to the meaning
[6] of the term "digitizer" in the '431 patent?

[7] A Well, the '431 patent delineates the use of
[8] digitizers on different devices.

[9] So there is more than one digitizer
[10] required.

[11] Q Could you explain that?

[12] A Do we have a laser pointer?

[13] Q If it is all right with the judge, maybe
[14] you can point.

[15] **JUDGE ZIEGLER:** Surely.

[16] A In the context of the patent, this is the
[17] simulator.

[18] And the simulator can have either a film
[19] plate, a cassette. Simulators also come with image
[20] intensifiers.

[21] Modern simulators can have an electronic
[22] portal imager.

[23] So if you are using the film on the
[24] simulator, you would have to develop the film and scan
[25] it in with a film digitizer.

[1] another in time. Within a given beam treatment.

[2] Or it can actually mean successive images
[3] between fractions.

[4] So that you could look at digitized images
[5] from fractions 1, 2, 3 on to 20 or the end of the
[6] treatment.

[7] Q In your opinion, was there a special
[8] definition of successive in the '431 patent?

[9] A Successive just means following one
[10] another.

[11] Q Let's go back to digitizing.

[12] Did you form an opinion as to the word
[13] "digitizing" in claim 21 of the '431 patent?

[14] A Well, digitizing simply means converting
[15] from an analog format to a digital format.

[16] That is all.

[17] Q Is the same true in claim 26?

[18] A True.

[19] Q Did you form an opinion as to the meaning
[20] of the word "x-ray image" in the '431 patent?

[21] A Well, x-ray image is simply an x-ray beam
[22] will pass through an object, if the object is not
[23] homogenous, the heterogeneities in the object will
[24] modify or modulate and attenuate the x-ray beam.

[25] But the pattern of an x-ray beam coming out

Page 86

Page 88

[1] If you are using an image intensifier, the
[2] output would go through a different type of digitizer
[3] on the treatment Linac.

[4] If you are using electronic portal imager,
[5] output goes through a digitizer within the EPI device
[6] itself.

[7] So there is different types of digitizers
[8] involved.

[9] Q Does the -- your understanding of the '431
[10] patent, is it limited to a single digitizer?

[11] A It can't be.

[12] Q Why is that?

[13] A Because the two devices are different.

[14] You can't have function in a department,
[15] simple necessity, if you are limited to one digitizer
[16] and images are flowing off the units at the same time.

[17] Q Is your belief based on the description in
[18] the '431 patent?

[19] A Yes.

[20] Q Continue on the '431 patent.

The term "successive".

[22] Did you form an opinion as to the meaning
[23] of the term?

[24] A Well, successive, within the context of the
[25] patent can mean either successive images following one

[1] from the backside of the object will have a modulated
[2] effluence.

[3] Any detector that sees that effluence will
[4] produce an image that reflects the differences in the
[5] photon intensity across the 2D image.

[6] Q In your opinion, is the term "x-ray image"
[7] as used in the '431 patent limited to a particular
[8] type of x-ray image?

[9] A X-ray image could be -- within radiation
[10] therapy could be the simulator image.

[11] It could be the portal image. It could
[12] be -- and it can vary in energy.

[13] It is not limited.

[14] Q Did you form an opinion as to the meaning
[15] of the term "reference image" in claim 26 of the '431
[16] patent?

[17] A Reference image simply means the image that
[18] the other images are referred back to.

[19] Q Is the term "reference image" in the '431
[20] patent limited to a particular type of image?

[21] **MR. ANTHONY:** It is leading, your Honor.

[22] Perhaps we can have the witness's testimony.

[23] **JUDGE ZIEGLER:** Overruled.

[24] A Reference image back in the time of the
[25] patent usually would refer to a simulator image.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 89

[1] But it also is not limited.
[2] It could be an image outside of the simulator.
[3] It could be that there is a reference image generated by setting up the patient on the linear accelerator.
[4] In effect, using the simulator -- the Linac as a simulator.
[5] But there is no limitation on reference image.
[6] Q In 1996, were there other types of reference images known in the radiotherapy field?
[7] A Well, at the time of the evolution of 3D planning, one can generate a digital reconstructed radiograph of a treatment beam in the treatment geometry. And one could use that as a reference image as an example.
[8] Q Are there any others?
[9] A Well, now one can use a CT simulator to generate a reference image.
[10] Q And in connection with the '431 patent, claim 21, did you form an opinion as to the meaning of the term "portal image"?
[11] A Within the confines of the patent itself, portal image is the image of the patient in the

[1] JUDGE ZIEGLER: We are going to take a ten minute recess, Mr. Anthony.
[2] Then we will come back and continue for your examination, if any.
[3] (Recess taken.)
[4] JUDGE ZIEGLER: I think we are moving to Mr. Anthony's cross examination.
[5] **CROSS EXAMINATION**
[6] BY MR. ANTHONY:
[7] Q Good morning, again, Doctor.
[8] A Good morning.
[9] Q The '554 patent, that is the patent in which we track patient movement during breathing, for example; is that correct?
[10] A Yes, sir.
[11] Q And that patent shows in claims camera means; is that correct?
[12] A Beg your pardon?
[13] Q Camera means is associated with the '554 patent; is that correct?
[14] A Yes, sir.
[15] Q And that is the camera that is looking at the patient and looking at fiducials so that you can turn the beam off at the appropriate time; is that correct?
[16]

Page 90

[1] treatment geometry.
[2] That is basic -- it is not restricted.
[3] Q In your understanding of the '431 patent, is the term "portal image" limited to a particular energy range?
[4] A No.
[5] Portal images can be acquired -- for example, if one is treating with a very high megavoltage beam, say 16MV, you can acquire a portal image with the six MV beam on the linear accelerator and get greater soft tissue discrimination.
[6] One could attach a kilovoltage x-ray tube on the side of the gantry as had been done back in those days and acquire a portal image by rotating the gantry to bring the KV tube in line with the treatment geometry and get a portal image with a low energy x-ray.
[7] Q What does a portal image do?
[8] A A portal image actually gives you the image of the patient in the treatment geometry.
[9] In other words, from the view of the source of the x-rays passing through the patient you have geometry of the patient relative to the geometry of the treatment machine.
[10] Q No further questions.

[1] A Yes, sir.
[2] Q And that requires pretty fast response?
[3] A Yes, sir.
[4] Q And did I understand that you said that camera could be a film camera?
[5] A No.
[6] Q It can't be a film camera?
[7] A No.
[8] Q You made reference, when asked what a camera means was, you made reference going all the way back to when Eastman Kodak discovered film, I believe it was.
[9] A Well, that is camera in general.
[10] Q I see.
[11] So a camera in general is not the camera of the '554 patent?
[12] A Not for looking at the fiducial markers, no, sir.
[13] Q And as of the filing date of that patent in September -- September 19th, 1996, did you identify for us particular cameras that people reading the specification would understand that camera to be?
[14] A You mean did I look for commercial examples?
[15] Q Or did you tell us as part of your

Page 91

Page 93

Page 95

[1] testimony this camera will work, and therefore it is
[2] part of the camera means of the '554 patent?
[3] **A** I did not identify any particular camera.
[4] **Q** And you didn't see an identification of any
[5] particular camera in the '554 patent; is that correct?
[6] **A** Just that it was a CCD type camera.
[7] **Q** But that is a broad category; is that
[8] correct?
[9] **A** Yes, sir.
[10] **Q** And some of the cameras that fall in that
[11] category would be satisfactory.
[12] Is that correct?
[13] **A** Yes.
[14] **Q** And some would be unsatisfactory?
[15] **A** Sure.
[16] **Q** And you run experiments to determine which
[17] ones performed adequately and which ones did not.
[18] Is that correct?
[19] **A** Yes, sir.
[20] **Q** Now, let me turn to the '431 patent.
[21] That is the patent where we matched two
[22] images, a portal image and a simulation image.
[23] **A** Yes, sir.
[24] **Q** And in that case, you told us about the
[25] digitizer of that patent.

Page 94

Page 96

[1] It is element 29, figure 1.
[2] He is going to put it on the screen.
[3] You can look at your own patent as well,
[4] sir.
[5] Why don't you look to your own patent,
[6] figure 1.
[7] There it is.
[8] So it is item 29 is the digitizer?
[9] **A** Yes, sir.
[10] **Q** Did I understand your testimony, sir, that
[11] that digitizer can be two different things?
[12] **A** Well, it all depends what is detecting the
[13] x-ray image.
[14] With respect to the patent, the simulator
[15] on the left could have a film.
[16] And a film cassette.
[17] If you are going to use that as a reference
[18] image, you would have to develop the film and scan it
[19] in to a scanner, then digitize the image that way.
[20] If it is a electronic portal imager, the
[21] imager provides a -- has a digitizer within it.
[22] And then moves the image off to the
[23] computer system.
[24] If it is a portal imager based on a
[25] scintillation screen with a reflecting mirror and a

[1] regular CCD camera, you would grab the image that way.
[2] And you would need a different type of
[3] digitizer for the image in digital format.
[4] **Q** Did you see any specific structure
[5] disclosed in this patent for any of those digitizers?
[6] I am referring to the '431 patent.
[7] **A** You mean any particular device identified?
[8] **Q** The structure of any of those digitizers.
[9] **A** I don't recall any particular structure.
[10] **Q** Now, sir, moving on to portal image, did
[11] you -- when we talk about portal image, now we are
[12] talking about the '431 patent, the matching of two
[13] images, portal and simulation, sir.
[14] **A** Yes, sir.
[15] **Q** And you would agree that portal images that
[16] are typically megavolt images?
[17] **A** It is very common they are megavolt images.
[18] **Q** And sir, these megavolt images have lower
[19] quality or resolution than the typical simulation
[20] image done at kilovolt power?
[21] **A** Well, to be specific, they will have lower
[22] contrast.
[23] Because the photon interaction is the
[24] Compton scattering.
[25] It gives you less contrast in the image.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 97

[1] A The shape of it.
[2] Q Yes.
[3] A Yes.
[4] Q And so should have the same gantry angle,
[5] table angle and collimator angle as the treatment
[6] beam?
[7] A Yes, sir.
[8] Q If the image, the portal image is not taken
[9] from the same angle as the treatment beam, it would
[10] not be useful image?
[11] A If one had a KV tube on the side of the
[12] gantry, you can rotate that tube in to the position of
[13] the x-ray beam that would be treated with, and you
[14] could obtain a higher contrast image of the treatment
[15] beam itself.
[16] And that we can regard as a portal image.
[17] Q Move to strike, your Honor.
[18] Nonresponsive.
[19] JUDGE ZIEGLER: Overruled.
[20] Q Let me ask the question.
[21] Listen to it very carefully.
[22] If the image is not taken from the same
[23] angle as the treatment beam, then it would not be a
[24] useful image?
[25] A I don't believe that to be the case.

[1] Q Now, point to the '431 patent, sir, where
[2] disclosure of that KV tube that rotates in that
[3] position --
[4] A It is not in there.
[5] Q It is not in there.
[6] A No.
[7] Q Thank you, sir.
[8] A It doesn't exclude it either.
[9] Q That is okay, sir.
[10] That finishes my cross.
[11] JUDGE ZIEGLER: All right, sir.
[12] Counselor.

REDIRECT EXAMINATION**BY MR. ZELE:**

[15] Q Does the '431 patent exclude the use of a
[16] KV?
[17] A No.
[18] It does not.
[19] Q Is there any particular part in the patent
[20] you could recall that describes the required power?
[21] A No.
[22] I don't recall.
[23] You mean required energy.
[24] Q Required energy.
[25] A No.

Page 98

[1] Haynes radiation therapy tube.
[2] Q Sir, do you recall being asked that
[3] question during your deposition?
[4] A Yes, sir.
[5] Q Sir, I will show you your testimony at page
[6] 92.
[7] Line 10.
[8] Through page 93, line 2.
[9] Would you read that testimony to yourself,
[10] please?
[11] A Where are we?
[12] Q Page 92, line 10.
[13] Through page 93, line 2.
[14] Read that to yourself, please.
[15] A "If in that system" --
[16] Q To yourself, sir.
[17] A Go ahead.
[18] Q Is it fair to say that the portal image,
[19] you must take the image at the same angle that
[20] represents the beam direction you treat with.
[21] Otherwise, it would not be a useful image?
[22] A And my response is that if the KV tube is
[23] in the same direction as the megavoltage beam, then
[24] you would have a higher contrast image and use that as
[25] a portal image.

[1] I don't recall.
[2] Q Is there one?
[3] A No.
[4] Q Counsel asked you if -- counsel asked you
[5] if there was a particular structure disclosed in the
[6] '431 patent that performs the digitizing.
[7] My question is slightly different.
[8] Does the '431 patent disclose a structure
[9] that performs digitizing?
[10] A Well, it is in line 29.
[11] Q What is that structure?
[12] A A digitizer.
[13] Q Would that digitizer be different types of
[14] digitizers?
[15] A Well, within the framework of figure 1, it
[16] would have to be, because you -- it is conceivable,
[17] again, that you would have a film image to digitize
[18] from the simulator.
[19] Or you could have an image intensifier tube
[20] image that you would have to digitize.
[21] Those are different digitizers that would
[22] be required as opposed to the digitizer built in to an
[23] electronic portal imager.
[24] So they are necessarily different
[25] digitizers.

[1] Q Would that be the understanding of one with
[2] ordinary skill in the art when the application was
[3] filed?

[4] A Yes. It would have been.

[5] JUDGE ZIEGLER: Anything further of this
[6] witness?

[7] MR. ZELE: No.

[8] JUDGE ZIEGLER: Mr. Anthony?

[9] MR. ANTHONY: No, your Honor.

[10] JUDGE ZIEGLER: Mr. Johnson, call your next
[11] witness.

[12] MR. JOHNSON: We have no further
[13] witnesses.

[14] We are ready to argue.

[15] JUDGE ZIEGLER: Plaintiff has presented its
[16] case.

[17] Varian has the opportunity -- you want to
[18] present oral argument as part of the presentation
[19] of your own case?

[20] MR. JOHNSON: I can do it now or I can
[21] wait.

[22] JUDGE ZIEGLER: I would prefer we wait.

[23] MR. JOHNSON: Good.

[24] JUDGE ZIEGLER: Is Varian ready to proceed?

[25] MR. ANTHONY: Yes.

[1] JUDGE ZIEGLER: Mr. Poppe.

DIRECT EXAMINATION

BY MR. POPPE:

[4] Q Dr. Balter, where are you employed?

[5] A At University of Michigan.

[6] Q What is your position there?

[7] A I am an associate professor in radiation
[8] oncology.

[9] Q How long have you been at University of
[10] Michigan?

[11] A For the past 15 years.

[12] Q Would you please describe your graduate
[13] education?

[14] A Certainly.

[15] I have a Ph.D. in medical physics through
[16] the radiation oncology department at University of
[17] Chicago, which was granted in 1992.

[18] Q Could you describe, please, what medical
[19] physics refers to?

[20] A Sure.

[21] Medical physics is the general practice of
[22] principles primarily understood by physicists to the
[23] safe application of medicine.

[24] In this case radiation oncology.

[25] Q And how did medical physics apply to the

[1] We are.

[2] JUDGE ZIEGLER: Mr. Anthony.

[3] MR. ANTHONY: Actually --

[4] MR. SNEATH: I will swap chairs.

[5] MR. POPPE: Varian would like to call
[6] Dr. James Balter as our first witness.

[7] MR. ANTHONY: I don't know if I presented
[8] Mr. Poppe before.

[9] This is Mr. Matt Poppe, a partner at
[10] Orrick.

[11] JUDGE ZIEGLER: Mr. Poppe, how are you,
[12] sir?

[13] MR. POPPE: Very well. Thank you.

[14] How are you?

[15] JUDGE ZIEGLER: Dr. Balter, come forward
[16] and raise your right hand.

[17] DR. JAMES BALTER

[18] called as a witness by the defendant, having been
[19] first duly sworn, as hereinafter certified, was
[20] examined and testified as follows:

[21] JUDGE ZIEGLER: State your full name.

[22] THE WITNESS: James Michael Balter.

[23] JUDGE ZIEGLER: How do you spell the last

[24] name?

[25] THE WITNESS: B-A-L-T-E-R.

[1] area of radiation oncology?

[2] A Radiation oncology is essentially clinical

[3] use of radiation both administered locally by

[4] brachytherapy and at a distance by teletherapy as
[5] described earlier this morning.

[6] To do so, we need to control the amount of
[7] radiation, the way in which it is delivered.

[8] And we need to understand how to model that
[9] radiation transport, so we can accurately deliver

[10] multitreatment beams previously described and safely
[11] operate the equipment necessary to handle the
[12] radiation delivery.

[13] Q I will ask if you could just slow down a
[14] little bit.

[15] A Certainly.

[16] Q Thank you.

[17] Do you have any particular research
[18] specialty?

[19] A Yes.

[20] I do.

[21] Q Could you describe that, please?

[22] A My research focuses on the areas of patient
[23] positioning.

[24] Organ motion.

[25] Patient modeling.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 105

[1] And imaging systems.
[2] Q Do any of those research specialties, that
[3] you have described, relate in any way to the '431
[4] patent?
[5] A Yes.
[6] They do.
[7] Q Would you please describe that?
[8] A The '431 patent deals with the general area
[9] of using image matching or registration techniques to
[10] aid in patient positioning and tracking and radio
[11] therapy.
[12] This was the major focus of my doctoral
[13] dissertation and significant focus of my research
[14] since then.
[15] Q How long has that been your research focus?
[16] A I would say I started looking at image
[17] matching problem in roughly 1989.
[18] Q Do you have any computer programming
[19] experience in connection with radiation therapy?
[20] A Yes.
[21] I do.
[22] Q Please describe that?
[23] A Prior to my doctoral dissertation, I worked
[24] both for universities and medical imaging companies
[25] doing computer programming, imaging applications.

Page 107

[1] JUDGE ZIEGLER: Any questions?
[2] MR. JOHNSON: No. For purpose of this
[3] hearing I stipulate.
[4] JUDGE ZIEGLER: Motion granted.
[5] BY MR. POPPE:
[6] Q Do you have in front of you a copy of the
[7] '431 patent?
[8] A Yes.
[9] I do.
[10] MR. POPPE: Your Honor, would you like a
[11] courtesy copy?
[12] JUDGE ZIEGLER: Why don't you give us an
[13] extra?
[14] Q Dr. Balter, you have been handed a copy of
[15] the '431 patent.
[16] Have you seen this patent before?
[17] A Yes.
[18] I have.
[19] Q Have you reviewed it?
[20] A Yes.
[21] I have.
[22] Q Have you formed an opinion regarding the
[23] level of education and experience that a person of
[24] ordinary skill in the art this patent would have?
[25] A I believe I have.

Page 106

Page 108

[1] During my doctoral dissertation I wrote
[2] code for image registration and image enhancement.
[3] Subsequent to my doctoral dissertation, I
[4] have written numerous programs for image registration,
[5] collaborated image registration experiments with other
[6] programmers.
[7] And developed computer control code for
[8] image registration and machine control.
[9] Q I will hand you a document and ask if you
[10] could please identify it for the record.
[11] If you could identify the correct exhibit
[12] for the record, please?
[13] A Yes.
[14] This is a copy of my curriculum vitae, CV.
[15] Q Is this a true and accurate copy and up to
[16] date as of the present date?
[17] A It is an accurate copy and is reasonably up
[18] to date.
[19] Q I move Dr. Balter's CV in to evidence.
[20] JUDGE ZIEGLER: Any objection?
[21] MR. JOHNSON: None.
[22] JUDGE ZIEGLER: Admitted.
[23] MR. POPPE: I would move to have Dr. Balter
[24] qualified as an expert on the subjects of portal
[25] imaging and x-ray image matching.

[1] Q Would you describe that opinion, please?
[2] A This patent deals with two technical
[3] concepts. That is the precision delivery of radiation
[4] and the use of computer base image registration
[5] methods.
[6] So a person of ordinary skill in the art at
[7] time of this patent would have to have skills that
[8] would understand both of these.
[9] Q What level of skill?
[10] A You can imagine two types of person.
[11] One would be, for example, a medical
[12] physicist with some exposure to image processing
[13] and/or computer programming techniques.
[14] The other type of person would be actually
[15] the opposite, a computer programming person, who is
[16] working for either a radiation oncology department,
[17] developing image processing techniques, or working for
[18] a company that is involved in developing portal
[19] imaging systems.
[20] Q I will direct your attention to the
[21] screen.
[22] We pulled up claim 21 from the patent.
[23] Have you reviewed this claim before?
[24] A Yes.
[25] I have.

Page 109

Page 111

[1] Q And I will refer you to four lines down,
[2] where it refers to a means digitizing successive
[3] portal images to generate successive sets of digital
[4] portal image signals.

[5] Now, we have asked you to identify the
[6] structure in the patent specification that corresponds
[7] to that digitizing means.

[8] Is that right?

[9] A That's correct.

[10] Q Have you done that?

[11] A Yes.

[12] I have.

[13] Q What did you conclude about the
[14] corresponding structure for the digitizing means?

[15] A Well, I could find two references to a
[16] digitizer. That as already described block 29 of
[17] figure 1.

[18] And also a sentence found in column 4 of
[19] the patent.

[20] And basically, there is no specific
[21] structure identified.

[22] Q Why do you say that?

[23] A All it shows is a box called digitizer on
[24] the graph, and all the digitizer says in column 4, if
[25] it is okay for me to quote from the patent

[1] application.

JUDGE ZIEGLER: Of course.

[3] A Is that the image matching system includes
[4] the digitizer, which digitizes a simulation image such
[5] as produced on the x-ray film, and the portal image
[6] such as that generated by the electron portal imager.

[7] Q Why is it your opinion those references to
[8] digitizer do not specify a specific structure?

[9] A Well, the problem is that there are many
[10] forms of digitizers available at the time -- of
[11] digitization available at the time.

[12] And the method of digitization would
[13] dramatically influence the utility of the resulting
[14] images that came from it.

[15] Q Would you please describe the types of
[16] digitizers available in 1996, that you are referring
[17] to?

[18] A Certainly.

[19] There were methods of digitizing films,
[20] which included mechanical optical scanners.

[21] Laser film scanners.

[22] And cameras connected to analog to digital
[23] converters.

[24] There were digital imaging systems, such as
[25] early portal imaging systems, which either had a

Page 109

Page 111

[1] camera and a mirror, and different types of cameras
[2] with different imaging characteristics.

[3] There was the liquid ion changing imager,
[4] which had crossing of high voltage wires, and the
[5] digital signals would in fact be the electrons
[6] collected at these crossings of wires.

[7] Q And does the '431 patent refer anywhere to
[8] any of those particular structures, that you just
[9] described?

[10] A I couldn't find any reference to any of
[11] those structures.

[12] Q Would all of those structures for
[13] digitizing that you described be equally useful for
[14] purposes of the '431 patent?

[15] A No.

[16] They would not.

[17] Q Why do you say that?

[18] A Because the different methods of
[19] digitization had different speeds.

[20] Different spatial resolutions.

[21] Different inherent contrasts.

[22] And they actually had artifacts and
[23] distortion.

[24] And each of these characteristics would
[25] affect the utility of the resulting images.

Page 110

Page 112

[1] application.

JUDGE ZIEGLER: Of course.

[3] A Is that the image matching system includes
[4] the digitizer, which digitizes a simulation image such
[5] as produced on the x-ray film, and the portal image
[6] such as that generated by the electron portal imager.

[7] Q Why is it your opinion those references to
[8] digitizer do not specify a specific structure?

[9] A Well, the problem is that there are many
[10] forms of digitizers available at the time -- of
[11] digitization available at the time.

[12] And the method of digitization would
[13] dramatically influence the utility of the resulting
[14] images that came from it.

[15] Q Would you please describe the types of
[16] digitizers available in 1996, that you are referring
[17] to?

[18] A Certainly.

[19] There were methods of digitizing films,
[20] which included mechanical optical scanners.

[21] Laser film scanners.

[22] And cameras connected to analog to digital
[23] converters.

[24] There were digital imaging systems, such as
[25] early portal imaging systems, which either had a

Page 110

Page 111

[1] camera and a mirror, and different types of cameras
[2] with different imaging characteristics.

[3] There was the liquid ion changing imager,
[4] which had crossing of high voltage wires, and the
[5] digital signals would in fact be the electrons
[6] collected at these crossings of wires.

[7] Q And does the '431 patent refer anywhere to
[8] any of those particular structures, that you just
[9] described?

[10] A I couldn't find any reference to any of
[11] those structures.

[12] Q Would all of those structures for
[13] digitizing that you described be equally useful for
[14] purposes of the '431 patent?

[15] A No.

[16] They would not.

[17] Q Why do you say that?

[18] A Because the different methods of
[19] digitization had different speeds.

[20] Different spatial resolutions.

[21] Different inherent contrasts.

[22] And they actually had artifacts and
[23] distortion.

[24] And each of these characteristics would
[25] affect the utility of the resulting images.

Page 110

Page 112

[1] application.

JUDGE ZIEGLER: Of course.

[3] A Is that the image matching system includes
[4] the digitizer, which digitizes a simulation image such
[5] as produced on the x-ray film, and the portal image
[6] such as that generated by the electron portal imager.

[7] Q Why is it your opinion those references to
[8] digitizer do not specify a specific structure?

[9] A Well, the problem is that there are many
[10] forms of digitizers available at the time -- of
[11] digitization available at the time.

[12] And the method of digitization would
[13] dramatically influence the utility of the resulting
[14] images that came from it.

[15] Q Would you please describe the types of
[16] digitizers available in 1996, that you are referring
[17] to?

[18] A Certainly.

[19] There were methods of digitizing films,
[20] which included mechanical optical scanners.

[21] Laser film scanners.

[22] And cameras connected to analog to digital
[23] converters.

[24] There were digital imaging systems, such as
[25] early portal imaging systems, which either had a

Page 110

Page 111

[1] In your opinion, would all those digitizing
[2] mechanisms work in the context of all of the claims --
[3] or of claims 21 and 26 of the '431 patent?

[4] A I don't believe so.

[5] Q Why is that?

[6] A For example, the liquid ion chamber
[7] digitizer required high level radiation dose and a lot
[8] of time to make an image.

[9] To do so would actually mean that part of
[10] the treatment would be in fact the imaging.

[11] And it would obviate methods such as
[12] tracking.

[13] The laser and mechanical film scanners are
[14] very slow.

[15] And the time it would take to take an x-ray
[16] film, digitize that film, take the digital image, and
[17] then use it to adjust the patient position would
[18] exceed the actual time it would take to treat the
[19] patient.

[20] There are other examples, the camera system
[21] itself introduces distortion.

[22] And this distortion could be similar to the
[23] deformation that could be tracked as patient motion in
[24] the methods described in the patent.

[25] Q I will turn your attention back to claim

University Of Pittsburgh v.
Varian Medical Systems, INC.,

<p style="text-align: right;">Page 113</p> <p>[1] 21, which is shown on the screen again.</p> <p>[2] And the same element of the claim that we</p> <p>[3] were looking at also refers to portal images.</p> <p>[4] Do you see that?</p> <p>[5] A Yes.</p> <p>[6] Q And have you formed an opinion as to what a</p> <p>[7] person of ordinary skill in the art in 1996 would have</p> <p>[8] understood portal image to mean as used in that claim?</p> <p>[9] A I think so.</p> <p>[10] Q Would you please describe your opinion?</p> <p>[11] A So I believe a person of ordinary skill in</p> <p>[12] the art at the time this patent was submitted would</p> <p>[13] believe a portal image to be an image taken through</p> <p>[14] the treatment portal by a megavoltage radiation beam.</p> <p>[15] It would be a two dimensional image.</p> <p>[16] Q What is your opinion based on?</p> <p>[17] A I was very active in the time in portal</p> <p>[18] imaging.</p> <p>[19] There was a small community of people who</p> <p>[20] were actually developing imaging systems, looking at</p> <p>[21] their utility and working out methods to use them.</p> <p>[22] The common terminology for portal image was an image</p> <p>[23] as described.</p> <p>[24] Q Did you rely on anything other than your</p> <p>[25] personal experience to develop an opinion regarding</p>	<p style="text-align: right;">Page 115</p> <p>[1] In addition, if we go to column 4. Lines</p> <p>[2] 44 to 46.</p> <p>[3] It says, "As discussed above, the</p> <p>[4] simulation in the portal image can be quite</p> <p>[5] different.</p> <p>[6] "One of the main reasons for this is</p> <p>[7] difference in the energy of the beams."</p> <p>[8] Thus indicating the difference megavoltage</p> <p>[9] versus kilovoltage.</p> <p>[10] Finally, column 5, lines 11 through 13,</p> <p>[11] describes the lack of contrast due to this megavoltage</p> <p>[12] imaging.</p> <p>[13] It says, "The remainder of portal image</p> <p>[14] shows little detail and does not indicate location of</p> <p>[15] the bones."</p> <p>[16] Q In your experience in the field in 1996 and</p> <p>[17] earlier, did you use the term "portal image" to refer</p> <p>[18] to kilovolt images?</p> <p>[19] A I did not.</p> <p>[20] Q And did you encounter other persons -- did</p> <p>[21] you have occasion during that period to interact with</p> <p>[22] other persons of skill in the art?</p> <p>[23] A Yes.</p> <p>[24] Q Did you ever hear any of them refer to a</p> <p>[25] portal image as a kilovolt image?</p>
<p style="text-align: right;">Page 114</p> <p>[1] the meaning of portal image?</p> <p>[2] A I did.</p> <p>[3] I read the patent application itself.</p> <p>[4] Q You are referring to the patent? Or the</p> <p>[5] application?</p> <p>[6] A The patent itself.</p> <p>[7] Q Any other materials?</p> <p>[8] A And the prosecution history.</p> <p>[9] Q Did you find anything in the patent that</p> <p>[10] informed your opinion about what a portal image is?</p> <p>[11] A I believe I did. Yes.</p> <p>[12] Q Would you please describe that?</p> <p>[13] A Certainly.</p> <p>[14] Again, if it is okay for me to quote the</p> <p>[15] patent.</p> <p>[16] JUDGE ZIEGLER: Yes.</p> <p>[17] A If you go to column 1, lines 44 to 46, it</p> <p>[18] says that -- I will give the whole paragraph.</p> <p>[19] "During the actual treatment phase the</p> <p>[20] patient is placed in the exact same position on</p> <p>[21] equipment as in simulation before the regular dosage</p> <p>[22] radiation, typically in the megavoltage range, is used</p> <p>[23] to treat the patient.</p> <p>[24] "During this phase another x-ray is taken</p> <p>[25] which is called the portal image."</p>	<p style="text-align: right;">Page 116</p> <p>[1] A I did not.</p> <p>[2] Q Back to claim 21.</p> <p>[3] The final element in this claim is a</p> <p>[4] tracking means.</p> <p>[5] Tracking movement between successive sets</p> <p>[6] of DPIS, which means Digital Portal Image Signals.</p> <p>[7] You were also given the task by us to</p> <p>[8] identify the structure corresponding to that tracking</p> <p>[9] means in claim 21.</p> <p>[10] Correct?</p> <p>[11] A That's correct.</p> <p>[12] Q And did you identify a corresponding</p> <p>[13] structure?</p> <p>[14] A I believe I did.</p> <p>[15] Q Would you please describe that?</p> <p>[16] A Certainly.</p> <p>[17] This tracking means is described in some</p> <p>[18] detail in the patent.</p> <p>[19] And specifically, it is schematically in</p> <p>[20] figure 3.</p> <p>[21] Figure 3 shows the tracking means consists</p> <p>[22] of two components.</p> <p>[23] So basically, the tracking means is most of</p> <p>[24] this figure.</p> <p>[25] It starts with this calculation of rough or</p>

Page 117

[11] coarse transformation based on x-ray opaque fiducials
[12] that are placed on the patient.
[13] And then following this rough
[14] transformation, this loop, if we can unzoom this
[15] picture, this loop is entered where the images are
[16] prepared for fine alignment.

[17] Fine alignment is performed using optical
[18] flow method.

[19] Then a loop proceeds, where a new image is
[20] acquired.

[21] And each subsequent image is analyzed with
[22] reference image, starting out with simulation image
[23] for the first alignment, being replaced by the next
[24] portal image for subsequent alignment.

[25] And each one of these entries in the loop
[26] generates tracking output, which is intended to be
[27] used to control the linear accelerator.

[28] **Q** In box 120, in this figure 3, it refers to
[29] calculating a rough approximation of the
[30] transformation.

[31] Does the '431 patent use any other
[32] terminology to describe that step?

[33] **A** Yes.

[34] It also describes it as a coarse
[35] transformation.

Page 117

[1] particular method of carrying out coarse alignment?

[2] **A** They do.

[3] And if I am not mistaken, we made a small
[4] video.

[5] With your permission I would like to show.

[6] **Q** Before we get there, could you first
[7] identify anywhere else in the patent that describes in
[8] more detail that concept of coarse alignment?

[9] **A** There are subsequent flow charts.

[10] Flow chart 7 with pointers to flow charts 5
[11] and 6 describe this.

[12] This was briefly shown earlier. If we have
[13] a slide of this, we can pull it back up.

[14] This is actually it.

[15] The coarse alignment is generally described
[16] in flow chart 7 here.

[17] It has components such as taking the
[18] markers and finding their centers. Described in
[19] figure 5.

[20] And it describes how the transformation is
[21] applied to the portal image in figure 6.

[22] **Q** You mentioned an animation.

[23] **A** Yes.

[24] So there is an animation. With your
[25] permission, I would like to show it.

Page 118

[1] **Q** Coarse alignment is another term that is
[2] used?

[3] **A** Yes.

[4] **Q** Is that a term that you had encountered in
[5] your experience in the art as of 1996?

[6] **A** Yes.

[7] I had.

[8] **Q** Could you please explain?

[9] **A** The concept of doing a coarse alignment
[10] prior to fine alignment was well known, especially at
[11] that time computers were not very powerful.

[12] So in order to have a computer aid in doing
[13] very detailed calculations, it was good to make a very
[14] good -- it was useful to make a very good first

[15] guess.

[16] So people develop methods where this first
[17] guess could be generated either automatically or with
[18] the aid of a user to help aid the subsequent fine
[19] alignment procedure.

[20] **Q** And in your opinion, how does the use of
[21] the term "coarse alignment" as you encountered it in
[22] other contexts prior to 1996 relate to the use of that
[23] term in the '431 patent?

[24] **A** I think it is essentially the same use.

[25] **Q** And does the '431 patent describe any

Page 118

Page 120

[1] So this describes the general scenario of
[2] the imaging that was to occur.

[3] The image on the left is representative of
[4] a simulator image with just a little cartoon
[5] description of where the fiducials would show up.

[6] They generally would show up fairly well in
[7] the image, although they would actually be dark.

[8] The MV image on the right is representative
[9] of portal image. In fact, portal images at the time
[10] this patent was applied for were even lower quality
[11] than this, believe it or not.

[12] Ideally, these images are presented so they
[13] line up one to each other relative to radiation
[14] field.

[15] But in practice, due to either the use of
[16] film or the imager orientation, the images might be
[17] translated.

[18] They might, in fact, be rotated relative to
[19] each other.

[20] And it is also possible they will present a
[21] different magnification.

[22] This is due to the fact the portal imager
[23] could be mobile relative to the position of the
[24] radiation beam.

[25] So the first step is to present these

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 121

Page 123

[11] images in rough coordinate system that matches.
 [12] This is accomplished by first detecting
 [13] these fiducials, which is generally easy to do with
 [14] computer algorithms.

[15] They show up very significant signals, very
 [16] high contrast.

[17] Once they are detected, you need to
 [18] identify corresponding fiducials, so they have a one
 [19] to one relationship. We know this point should be
 [20] this point.

[21] And this point should be this point.

[22] The centers of those fiducials are then
 [23] extracted.

[24] So we would then reduce these images to
 [25] just a few coordinates, which are the centers of each
 [26] of these extracted fiducials.

[27] So just these coordinates would then be
 [28] used for an alignment.

[29] This alignment procedure is relatively
 [30] straight forward.

[31] This graphic shows what generally happens.

[32] But each of these coordinates is then
 [33] magnified, translated and rotated, so that they
 [34] overlay.

[35] In the real world, the overlay would not be

[11] information.

[12] Q In your opinion, which if any of these
 [13] steps are necessary to carry out the tracking means
 [14] described in claim 21?

[15] A As described in the patent, I believe all
 [16] of these steps are necessary.

[17] Q And actually, to go back to the coarse
 [18] alignment you were describing earlier, which of those
 [19] steps in your opinion, if any, were necessary to carry
 [20] out the tracking function described in claim 21?

[21] A As described in the patent, I believe all
 [22] those steps are necessary.

[23] Q Can you describe the manner in which this
 [24] preparation for fine alignment proceeds according to
 [25] the patent?

[26] A We have another video, if it is okay to
 [27] show.

JUDGE ZIEGLER: It is.

[28] A So after these points are aligned, you can
 [29] imagine that the images are also rotated and magnified
 [30] in scale relative to each other, which means there is
 [31] only specific overlap region, if we can show in the
 [32] video, that has information from both the portal image
 [33] and simulation image.

[34] So to aid in the fine alignment, the

Page 122

Page 124

[11] perfect, because fiducials can be -- easily be placed
 [12] in the exact same configuration on the patient.

[13] And the patient's body may be slightly
 [14] rotated relative to beam each time they are
 [15] positioned.

[16] Q And this represents the coarse alignment
 [17] algorithm as you understand it?

[18] A This represents the coarse alignment
 [19] algorithm as I understand it.

[20] Q If we could go back to figure 3.

[21] What is the next step, sort of general step
 [22] in the algorithm described in the patent?

[23] A The next step after coarse alignment is
 [24] this preparation step.

[25] Where the images will be slightly modified
 [26] to help with the subsequent fine alignment process.

[27] Q Is that preparation for fine alignment
 [28] described in any greater detail in the patent?

[29] A Yes. It is.

[30] Preparation for fine alignment is described
 [31] in figure 8, if I am not mistaken.

[32] So there are two steps to this.

[33] The first step is to calculate a
 [34] intersection between the images. Second step is
 [35] enhance the images so they present with similar

[11] information presented is reduced to not only this
 [12] information but a subset that is a simpler geometric
 [13] shape such as rectangle.

[14] The other information is discarded. And
 [15] then the two images are sampled.

[16] So the resulting images that enter the fine
 [17] alignment process would be, and we will show this on
 [18] the left, similar image of reduced information. We
 [19] just cropped off the area that doesn't overlap.

[20] And a portal image of again reduced
 [21] information for two reasons.

[22] We also cropped --

JUDGE ZIEGLER: A little slower.

[23] A We can stop the video one second.

[24] And go to the end of the video and stop it.
 [25] So the end result would be -- these images

[26] have a region of overlap.

[27] This overlap region has a complex shape.

[28] To help the fine alignment, the shape is
 [29] reduced to a simpler shape such as this rectangular
 [30] region here.

[31] This rectangular region is sampled from the
 [32] simulator image.

[33] And the transformed portal image.

[34] So the result are these two images with the

Page 125

Page 127

[1] similar image.
[2] Please pause.
[3] The similar image showing the space that
[4] overlaps that rectangle.
[5] And the portal image showing the space that
[6] overlaps that rectangle further limited in the fact
[7] there is no anatomy visible outside the treatment
[8] portal itself as well.
[9] These images are enhanced by techniques
[10] known at the time.
[11] So that they show similar contrast
[12] information as well as can be achieved for the
[13] different inherent contrasting images.
[14] Q Following completion of this preparation
[15] for fine alignment, does the patent describe any other
[16] steps in the tracking process?
[17] A Yes.
[18] Q What does it describe?
[19] A It describes calculation of refined image
[20] transformation and then tracking loop subsequent to
[21] that.
[22] Q And we have figure 3 back up on the board.
[23] Could you please refer us to where you see the fine
[24] alignment?
[25] A Calculate refined image transformation is

[1] guess on a slightly higher resolution image.
[2] We take the image. Let's say it has 100
[3] pixels.
[4] We down sample it by a factor of eight.
[5] Let's say 12 pixels by 12 pixels.
[6] After we get our first guess as to how it
[7] lines up, we increase resolution, for example, to 24
[8] by 24 pixels.
[9] We will make a more refined guess. Then 48
[10] pixels.
[11] Until we get to final resolution.
[12] Q I would like to direct your attention in
[13] particular to box 164, where it says robust
[14] optimization.
[15] Please explain what that refers to.
[16] A So the method of alignment.
[17] And this is described further in figure 10
[18] for robust optimization points to a paper by Placon
[19] and Onden that was described in the prosecution
[20] history of this application.
[21] If we go to figure 10. This is a
[22] description of the methodology.
[23] It has two components to it.
[24] It has this concept of we call robust flow.
[25] So flow is a method of aligning images so

Page 126

Page 128

[1] shown in box 160 here.
[2] Which actually points to two flow charts.
[3] Figures 9 and 10 of the patent application.
[4] Q And in your opinion, which, if any, of the
[5] steps shown here in figure 3 and in figures 9 and 10,
[6] if any, are necessary to performing the tracking
[7] function described in claim 21?
[8] A Again, I believe they are all necessary.
[9] Q And then still referring to the fine
[10] alignment process, could you please describe how the
[11] patent describes fine alignment proceeding?
[12] A Certainly.
[13] If we can go to figures 9 and 10.
[14] I can show this in detail.
[15] So figure 9 is sort of the overall loop of
[16] what happens.
[17] In order to again help a computer do this
[18] efficiently, we actually start out by taking the
[19] images and making them blurry.
[20] We make them lower resolution.
[21] We reduce the amount of information
[22] presented.
[23] And then calculate an alignment, which I
[24] will describe in more detail in a second.
[25] And from that alignment, we use as initial

[1] their intensity gradients track each other.
[2] And making robust means there is a process
[3] which I won't describe in too much detail called
[4] regularization.
[5] And this process is designed to restrict
[6] the spatial incoherence of the motion.
[7] The other component is this sensitivity of
[8] outliers and inliers.
[9] This algorithm has this waiting factor that
[10] is designed to say that if some of the points move,
[11] this is a deformable alignment.
[12] Every point can theoretically move
[13] independently.
[14] If some of the points move excessively,
[15] they can be labeled as outliers and not influence the
[16] final transformation too significantly.
[17] Q Would you please pull up figure 11 on the
[18] patent?
[19] Dr. Balter, have you seen figure 11 of the
[20] patent before?
[21] A Yes.
[22] I have.
[23] Q What does it represent?
[24] A Figure 11 is also described in box 140 of
[25] figure 3.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 129

Page 131

[1] This is the component for tracking,
[2] essentially.

[3] It involves taking the new transformation
[4] that comes out of the coarse followed by fine
[5] alignment.

[6] Combining it with previous transformation
[7] so we can continuously update the transformation as a
[8] new set of images is acquired.

[9] It shows here replace simulation with
[10] current portal image.

[11] So the first step in tracking is to align
[12] the first portal image taken in a tracking series to a
[13] simulation image.

[14] After that alignment is done and that
[15] information is generated, this portal image that was
[16] aligned becomes a new reference image.

[17] And it would be then aligned to any
[18] subsequent portal images required.

[19] This also contains a box that says use this
[20] information essentially to control the linear
[21] accelerator.

[22] Q Which, if any, of these steps in your
[23] opinion is necessary to perform the tracking function
[24] of claim 21?

[25] A I think all of them are necessary.

[1] Q And you will note there is also a
[2] processing means, processing said first and second
[3] digital signals without input of any physical
[4] dimensions of any features within said images to
[5] generate matched digital image signals.

[6] And have you developed an opinion regarding
[7] the corresponding structure for this processing means?

[8] A Yes. I have.

[9] Q And how does that relate to your testimony
[10] as you have provided it so far?

[11] A Again, I think this requires the exact
[12] steps described in figure 3.

[13] But used once.

[14] And we can go to figure 3, if necessary.
[15] Essentially, it involves calculating rough
[16] transformation, calculating fine transformation,
[17] displaying results possibly.

[18] And then finishing.

[19] Q Does it include that box 140?

[20] A It does not include that box 140.

[21] This loop is not entered in this simple
[22] matching procedure.

[23] Q Are you aware of any publications existing
[24] prior to October of 1996, that described matching
[25] algorithms for x-ray images?

Page 130

Page 132

[1] Q And referring in particular to box 144 in
[2] figure 11, where it refers to generating controlling
[3] feedback signals for connected equipment, why is it
[4] your opinion that that is a necessary step in the
[5] tracking function?

[6] A Because the patent describes that tracking
[7] is a process of using this image matching procedure to
[8] either move the system or gate the radiation beam.

[9] Q I will now direct your attention to claim
[10] 26, which is the other asserted claim in this patent.

[11] Have you had a chance to review this claim?

[12] A Yes.

[13] I have.

[14] Q And you will note that this also refers to
[15] a means digitizing, more specifically means digitizing
[16] said x-ray image and reference image to generate first
[17] digital image signals and second digital image
[18] signals, respectively.

[19] Have you developed an opinion regarding the
[20] corresponding structure for this digitizing means?

[21] A Yes.

[22] I have.

[23] Q And how does that opinion compare with your
[24] opinion on the similar term in claim 21?

[25] A I believe I still have the same opinion.

[1] A Yes.

[2] Several.

[3] Q Approximately, how many that you are aware
[4] of?

[5] A I haven't counted.

[6] But I would have to say there are over 20
[7] certainly by 1996.

[8] Q Did you author any of those preOctober 1996
[9] publications?

[10] A Yes.

[11] I wrote two peer reviewed manuscripts in
[12] that time period on the development and application of
[13] image registration for portal images.

[14] Q You use the term "image registration".

[15] What does that mean?

[16] A Image registration is another term for
[17] matching.

[18] Q And did any of the preexisting algorithms,
[19] that you have encountered performed specific function
[20] of the processing means of claim 26, namely processing
[21] digital signals for two x-ray images without input of
[22] any physical dimensions of any features within said
[23] images to generate match digital image signals?

[24] A Yes.

[25] There were a few of them at the time.

Page 133

Page 135

[1] **Q** Are there any particular ones you have in
[2] mind?
 [3] **A** Well, the first one that I know of for
 [4] fully automated alignment of images was from a group
 [5] in the Netherlands Cancer Institute, two authors, Urin
 [6] Byhold and Kenneth Hidhouse, wrote papers on methods
 [7] that automatically -- extracted features that showed
 [8] up as edges in images and had these features to
 [9] describe a space for automatic alignment.
 [10] **A** group at M.D. Anderson both Jones and
 [11] Boyer, and Dong and Boyer, wrote methods that just
 [12] completely used all of the information automatically
 [13] by correlation using 4A transforms directly.
 [14] **A** group in London, Ontario with Moseley and
 [15] Munro, developed a method where a number of subregions
 [16] were selected in the images.
 [17] And these subregions were aligned by a
 [18] process called cross correlation.
 [19] Papers cited actually in the prior art and
 [20] in this patent is by Radcliffe, a method called
 [21] pseudocorrelation, which is a fully automated method,
 [22] which used a subset of the image and developed a
 [23] technique to guess at transformations such that images
 [24] had similar pixel content.
 [25] And that pixel content was narrowly

[1] **Q** Did I hear you correctly that you had an
 [2] understanding of what coarse alignment meant as of
 [3] 1996?
 [4] **A** Yes.
 [5] **Q** What did you say it meant?
 [6] **A** Coarse alignment meant doing an alignment
 [7] that was an approximation, a reasonable approximation.
 [8] **Q** All right.
 [9] And that alignment, would you consider that
 [10] understanding to be something that was known by
 [11] someone of ordinary skill?
 [12] **A** I would say so, yes. As I defined ordinary
 [13] skill.
 [14] **Q** Look at figure 1 of the patent.
 [15] Is that figure 1 of the '431 patent?
 [16] **A** Yes, it is.
 [17] **Q** And you see the box 33?
 [18] **A** Yes.
 [19] **Q** It says coarse alignment?
 [20] **A** Yes.
 [21] **Q** You agree with me somebody of ordinary
 [22] skill would understand looking at that box that what
 [23] coarse alignment meant?
 [24] **A** Yes.
 [25] I do believe that.

Page 134

Page 136

[1] matched.
 [2] The McParland paper also referenced in this
 [3] was a concept where a coarse in final alignment was
 [4] applied and fine alignment was done automatically.
 [5] **Q** Does the existence of those preexisting
 [6] algorithms, that you have described, affect your
 [7] opinion regarding the scope of claims 21 and 26 of the
 [8] '431 patent?
 [9] **A** Yes.
 [10] It does.
 [11] **Q** In what way?
 [12] **A** Given that there were a number of
 [13] automatic, manual and what I call hybrid, which are
 [14] user aided automatic procedures that were developed,
 [15] published, well known at the time. It would seem that
 [16] the unique aspect of the '431 patent is the very
 [17] specific method described where they did this
 [18] alignment.

[19] **MR. JOHNSON:** Objection.

Calls for speculation.

JUDGE ZIEGLER: Overruled.

MR. POPPE: No further questions.

JUDGE ZIEGLER: Cross examine.

CROSS EXAMINATION

BY MR. JOHNSON:

[1] **Q** All right.
 [2] And they would understand that without
 [3] regard to any algorithm, isn't that correct?
 [4] **MR. POPPE:** Objection.
 [5] Vague.
 [6] **JUDGE ZIEGLER:** Overruled.
 [7] **A** Can you describe -- can you describe that
 [8] in more detail?
 [9] That question in more detail.
 [10] **Q** No.
 [11] Somebody of ordinary skill in the art,
 [12] looking at box 33, using your understanding -- I am
 [13] only asking, they would understand that without
 [14] requiring the need to look at any algorithm, wouldn't
 [15] they?
 [16] **A** They would not be able to determine how
 [17] effective the coarse alignment is without knowing the
 [18] methodology.
 [19] **Q** I didn't ask you about effectiveness,
 [20] Doctor.
 [21] I asked you, they would understand that
 [22] without regard to looking at any algorithm.
 [23] Isn't that right?
 [24] **A** They would understand from the words coarse
 [25] align, a rough alignment is to be done.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 137

Page 139

[1] Q All right.
[2] And you understood that there were
[3] different ways of doing a rough or coarse alignment
[4] back in 1996.
[5] Correct?
[6] A Correct.
[7] Q You also understood that somebody of
[8] ordinary skill in the art looking at figure 1 would
[9] have understood what a fine alignment was?
[10] A Most likely, yes.
[11] Q And you also understand by looking --
[12] simply at figure 1, not referencing any algorithm,
[13] they would understand that there were techniques
[14] available to allow one to do a fine alignment.
[15] Correct?
[16] A They would understand that a number of
[17] other investigators had developed techniques, which
[18] were published and well known at the time.
[19] Q All right.
[20] So in your opinion, based solely on figure
[21] 1, someone of ordinary skill in the art would be able
[22] to determine a coarse alignment was required using an
[23] approach to accommodate that, and would also
[24] understand a fine alignment was required and use an
[25] approach to accommodate that?

[1] solved is to deal with coarse and fine alignment, and
[2] I need to digitize an image, that I could select a
[3] digitizer that would accomplish that result?
[4] A I am not convinced, actually.
[5] Q Well, would a digital camera allow you to
[6] take a picture of the patient and convert the analog
[7] image to pixels, which would enable you to do a coarse
[8] alignment?
[9] A It could enable me to acquire an image of a
[10] patient.
[11] It may allow me to do coarse alignment.
[12] It depends on image quality of that image.
[13] Q That's right.
[14] So if I had a 4.0 megapixel camera, and I
[15] took just -- that I bought from I don't know which
[16] stores you have out here, Fry's where I come from, and
[17] took a picture, that picture would convert an analog
[18] signal, which is how we see the world in to digital,
[19] basically pixels, and I could feed that information in
[20] to that processor and do a coarse alignment.
[21] Correct?
[22] A I would need to know what lens is
[23] involved.
[24] And certainly at the time this patent
[25] application was filed, four megapixel cameras were not

Page 138

Page 140

[1] MR. POPPE: Objection.
[2] Compound.
[3] JUDGE ZIEGLER: Overruled.
[4] A I believe they would understand that.
[5] Q Now, I want you to look at box 29.
[6] It says digitizer.
[7] You told us that there were a number of
[8] digitizers on the market on or before 1996.
[9] Correct?
[10] A Correct.
[11] Q And I believe you told us that some of
[12] those digitizers would not be suitable for use in this
[13] particular application.
[14] Correct?
[15] A Correct.
[16] Q Somebody of ordinary skill in the art would
[17] understand that there were digitizers that were
[18] suitable for this particular application.
[19] Isn't that right?
[20] A Without having enough knowledge of the
[21] details of the algorithm, this graph alone would not
[22] be able to determine whether there is sufficient
[23] digitizer, actually.
[24] Q Isn't it true, sir, that if I am somebody
[25] of ordinary skill in the art, and the problem to be

[1] a common device.
[2] Q Well, call it a one megapixel camera.
[3] A I would still worry about lens distortion
[4] associated with this.
[5] Q It is true, is it not, someone of ordinary
[6] skill in the art would have the ability just like a
[7] lay person such as myself to select the lens that
[8] wouldn't result in a distorted image?
[9] A No.
[10] All lenses have distortions.
[11] Q Okay.
[12] An image that would be sufficiently
[13] distorted so it would render you incapable of doing
[14] this coarse or fine alignment?
[15] A The fine alignment is of grave concern.
[16] Because the fine alignment in theory goes beyond the
[17] level of distortion of a typical lens.
[18] Q It is simply a matter of the contrast,
[19] isn't it?
[20] A No.
[21] I mean, light bends through a lens.
[22] So if I take a piece of graph paper, take
[23] an image of it through a lens, I don't get regular
[24] piece of graph paper out, I get a bent image.
[25] Q But that image can be clearer than other

[1] bent images.
[2] Correct?
[3] A What do you mean by clearer?
[4] Q I mean clearer to you as the viewer.
[5] A I don't understand the question.
[6] Q Well, if you have a fuzzy image and an
[7] image less fuzzy, I will call it clearer.
[8] Are you telling me that if I have a fuzzy
[9] image and one less clear, you don't understand what
[10] that means?
[11] A I understand a blurry image and a sharper
[12] image.
[13] Q So if you have a sharper image as
[14] contrasted to the blurry image, that would constitute
[15] fine alignment to one of ordinary skill in the art.
[16] Wouldn't it?
[17] A No.
[18] Fine alignment means accurately getting a
[19] transformation that goes throughout the image.
[20] It involves a process of deformation.
[21] And if the lens itself induces a
[22] deformation, that deformation could be misconstrued
[23] from a perfectly visible image as patient deformation
[24] when it is in fact not.
[25] Q If you select the lens that doesn't have

[1] at the time to use a TV camera and a frame grabber as
[2] a video digitizer?
[3] A It was known as a digitizer, yes.
[4] Q And you could use this video digitizer to
[5] accomplish this coarse and fine alignment?
[6] A I am not convinced I can accomplish fine
[7] alignment with a --
[8] Q Are you convinced you couldn't?
[9] A I am convinced there is not enough
[10] information in this patent that would make it possible
[11] to do it.
[12] Q Now, let me ask you to, if you will, you
[13] were talking about tracking movement.
[14] Do you recall that?
[15] A Yes.
[16] Q Would you put up column 3 for me, please?
[17] If you will go to line 29.
[18] It says, "In the tracking mode, the updated
[19] transform is used to track movement between successive
[20] sets of digital portal image signals."
[21] A Yes.
[22] Q What do you understand tracking to mean in
[23] the context of that sentence, sir?
[24] A So the context of this is that if a patient
[25] moves, the idea of the tracking system is to detect

[1] the deformation, then you solve that problem.
[2] Haven't you?
[3] A No lens has no deformation.
[4] It is the way optics works.
[5] Q So if I understand what you just told me
[6] then, it is impossible to do fine alignment, because
[7] no lens does not have deformation, is that it?
[8] A No.
[9] You asked me a question about the nature of
[10] a camera based digitizer.
[11] Q So you are telling me you can't have a
[12] camera based digitizer?
[13] A I am saying you need to do extra work with
[14] a camera digitizer not specified in this patent to fix
[15] lens distortion.
[16] Q You know Mr. Munro, don't you?
[17] A Dr. Munro, yes.
[18] Q Are you familiar with his articles written
[19] by him?
[20] A Reasonably so.
[21] Q Were you aware he made specific reference
[22] to making portal films using our TV camera and frame
[23] grabber as a video digitizer back in 1989?
[24] A Absolutely.
[25] Q You think that is something that was known

[1] that motion.
[2] Q And it says, "Tracking can be used to
[3] terminate the radiation, if patient movement exceeds
[4] specified limits. Or could be used to operate the
[5] patient positioning assembly to maintain the radiation
[6] beam in proper alignment with the area to be treated."
[7] A Yes.
[8] Q In other words, tracking means what it
[9] says.
[10] You are tracking movement. The patient
[11] movement.
[12] Correct?
[13] A Yes.
[14] It tracks the movement of the patient.
[15] Q And somebody of ordinary skill in the art
[16] reading that language would understand that to be the
[17] case.
[18] Correct?
[19] A I believe so.
[20] Yes.
[21] Q Thank you.
[22] Now, could we look at column 4, please?
[23] Lines -- I think that is 37.
[24] You told us about portal image. Recall
[25] that?

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 145

Page 147

[1] **A** Yes.

[2] **Q** It says, "Following completion of the simulation, the patient 3 is transferred to the treatment setup 1. As shown, the treatment setup at 1 is similar to the simulation setup 1, except that the x-ray beam 11 prime is in the megaelectron volt range. A portal image is generated by the treatment setup 1. This portal image can be captured by an x-ray film as in the simulation setup. However, it is preferred that an electronic portal imager 25 be used. If available, an electronic imager could also be used in place of the x-ray film 23 in the simulation setup 1."

[14] See that language?

[15] **A** I see that language.

[16] **Q** Now, is there anything that says that the image in this portal image is limited to megaelectron volt range?

[19] **A** It says except that the x-ray beam is in the megaelectron volt range.

[21] **Q** Correct.

[22] But does it say it has to be in the megaelectron volt range?

[24] **A** It says, "As shown the treatment is similar except that the x-ray beam is in the megaelectron volt

[1] Correct?

[2] **A** Could you describe which particular result?

[3] **Q** I think this was your tracking means.

[4] **A** Yes.

[5] So I believe that I did not mention box 110.

[7] I did not mention transform and display images.

[9] And the end.

[10] I described the loop that started at 120, went through these stages and went back through here.

[12] **Q** Did you look at the claims in the patent, sir?

[14] **A** I did.

[15] **Q** Did you have an understanding that they were dependent claims?

[17] **A** Could you describe dependent claims?

[18] **Q** I am asking if you have an understanding.

[19] **A** Barring a definition of dependent claims, I came to understand that they described one complete invention.

[22] **Q** And did you have an understanding that the patent specification and drawings had to cover all of the elements of the claims, to support all of the claims that were listed in the patent?

Page 146

Page 148

[1] range." I don't understand any other interpretation.

[2] **Q** Let's see if I can help you out. Go to

[3] column 1, if you will, please.

[4] If you will, go to lines 40 through 46.

[5] It says, "During the actual treatment phase, the patient is placed in the exact same position on the equipment as in the simulation before the regular dosage x-ray radiation, typically in the megaelectron volt range, is used to treat the patient. During this phase, another x-ray image is taken, which is called the portal image."

[12] See that?

[13] **A** Yes.

[14] **Q** Now, in looking at the definition, or I should say the description of this x-ray, does it limit itself to particular voltage?

[17] **A** It suggests megaelectron volt range.

[18] It does it in a couple of places.

[19] **Q** Now, when you were telling us about the algorithm, I want to go specifically to one that you pointed out.

[22] I believe it is figure 3.

[23] You said -- if I understood you correctly, all of these steps were required in order to accomplish this particular result.

[1] **A** I can imagine that is the case.

[2] **Q** So you understood there wasn't one giant claim here.

[4] There were numerous claims.

[5] Correct?

[6] **A** Yes.

[7] **Q** And you could look at different parts of the specification in the drawings to find support for each individual claim. Correct?

[10] **A** Absolutely.

[11] **Q** So it is not your testimony that for purposes of -- that this drawing was limited to covering only the tracking mean for all of the claims. Is it?

[15] **A** It is not my testimony that every element in this drawing is necessary for the tracking claims, specifically this 110.

[18] **JUDGE ZIEGLER:** Anything further?

[19] **MR. JOHNSON:** Nothing further.

[20] **JUDGE ZIEGLER:** Counselor.

[21] **MR. POPPE:** A couple questions, if I may.

[22] **JUDGE ZIEGLER:** You may.

[23] **REDIRECT EXAMINATION**

[24] **BY MR. POPPE:**

[25] **Q** If you could bring up figure 1 again,

	Page 149		Page 151
<p>[1] please.</p> <p>[2] Dr. Balter, do you recall Mr. Johnson</p> <p>[3] asking you a couple questions about this figure?</p> <p>[4] A Yes.</p> <p>[5] Q And referring in particular to the box in</p> <p>[6] the middle labeled coarse align, box No. 33, do you</p> <p>[7] see that?</p> <p>[8] A Yes.</p> <p>[9] Q You were asked a question about that.</p> <p>[10] A Yes.</p> <p>[11] Q Now, you testified that you are aware of</p> <p>[12] multiple ways of performing coarse alignment. Is that</p> <p>[13] correct?</p> <p>[14] A Correct.</p> <p>[15] Q And in your opinion, would a person of</p> <p>[16] ordinary skill in the art in 1996 reading the entire</p> <p>[17] patent including all of the figures and all of the</p> <p>[18] text understand that any coarse alignment mechanism</p> <p>[19] could be used to perform the tracking function</p> <p>[20] described in claim 21?</p> <p>[21] MR. JOHNSON: Leading.</p> <p>[22] JUDGE ZIEGLER: Overruled.</p> <p>[23] A I don't believe so.</p> <p>[24] Q Why is that?</p> <p>[25] A The '431 patent describes a very specific</p>	<p>[1] different treatment fractions occurring at different</p> <p>[2] points in time?</p> <p>[3] MR. JOHNSON: This is beyond the scope of</p> <p>[4] cross.</p> <p>[5] JUDGE ZIEGLER: Overruled.</p> <p>[6] A I recall hearing that.</p> <p>[7] Q Do you agree with that testimony of</p> <p>[8] Dr. Schell?</p> <p>[9] A I am afraid I have to respectfully</p> <p>[10] disagree.</p> <p>[11] Q Could you explain?</p> <p>[12] A The system describes tracking in order to</p> <p>[13] control the radiation equipment by adjusting position,</p> <p>[14] by turning the beam off.</p> <p>[15] First of all, tracking itself was a</p> <p>[16] commonly used term in 1996 for motion that occurs</p> <p>[17] during a single treatment session, intratreatment</p> <p>[18] motion.</p> <p>[19] Second, using a measurement today to</p> <p>[20] control a couch tomorrow doesn't make sense.</p> <p>[21] There are large number of variables</p> <p>[22] involved in patient positioning.</p> <p>[23] And using this transformation to so called</p> <p>[24] track between subsequent inspections in control of the</p> <p>[25] accelerator simply wouldn't work.</p>		
<p>[1] method.</p> <p>[2] And it specifically says a couple things.</p> <p>[3] Including in the prosecution history.</p> <p>[4] It says without input of any physical</p> <p>[5] dimensions of any features.</p> <p>[6] Which would mean that it has to be</p> <p>[7] completely automated.</p> <p>[8] And if you specifically look at the patent.</p> <p>[9] It actually describes that the rough transformation</p> <p>[10] comes directly from this alignment of the radio-opaque</p> <p>[11] markers.</p> <p>[12] Q If I put the same question to you with</p> <p>[13] respect to the processing means and the processing</p> <p>[14] function of claim 26, what would your answer be with</p> <p>[15] respect to coarse alignment?</p> <p>[16] A So again, it specifically has to point to</p> <p>[17] the structure described in the patent application.</p> <p>[18] Q Now, on a different topic, you were asked a</p> <p>[19] question about whether tracking as described by the</p> <p>[20] patent refers to the tracking of patient movement.</p> <p>[21] Do you recall those questions?</p> <p>[22] A Yes.</p> <p>[23] Q And do you recall hearing some testimony</p> <p>[24] from Dr. Schell, that tracking could cover the</p> <p>[25] tracking of different patient positions during</p>	<p>[1] Page 150</p> <p>[2] MR. POPPE: No other questions.</p> <p>[3] JUDGE ZIEGLER: Mr. Johnson?</p> <p>[4] MR. JOHNSON: I didn't understand the last</p> <p>[5] response.</p> <p>[6] RECROSS EXAMINATION</p> <p>[7] BY MR. JOHNSON:</p> <p>[8] Q You track patient movement, either</p> <p>[9] breathing, correct?</p> <p>[10] JUDGE ZIEGLER: You have to answer yes or</p> <p>[11] no.</p> <p>[12] A Yes.</p> <p>[13] Q Or you can track patient movement by</p> <p>[14] repositioning.</p> <p>[15] Correct?</p> <p>[16] A Okay.</p> <p>[17] So the first thing you said is tracking as</p> <p>[18] in measurement, which is measuring or observing</p> <p>[19] breathing motion.</p> <p>[20] The second thing you said is controlling</p> <p>[21] patient equipment, which is a separate component</p> <p>[22] traction, which is reaction to a measurement that you</p> <p>[23] make.</p> <p>[24] Q So I was right?</p> <p>[25] A Those are separate things.</p> <p>[26] Q That's right.</p>	Page 152	

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 153

Page 155

[1] And your last response was talking about
[2] patient movement as it relates to positioning.
[3] Correct?
[4] **A** No.
[5] Tracking movement means tracking within a
[6] specific time period.
[7] Tracking contains two components.
[8] Monitoring and reaction.
[9] And monitoring is specifically designed,
[10] and it was known at the time as intratreatment motion.
[11] **Q** Can you show me anything in the '431 patent
[12] that says tracking is limited to a specific period in
[13] time?
[14] **A** It does not say a specific period of time.
[15] **Q** It doesn't even discuss it, does it?
[16] **A** It does not discuss a period of time,
[17] although it uses the term "movement". And the term
[18] "tracking".
[19] **MR. JOHNSON:** Nothing further.
[20] **JUDGE ZIEGLER:** Thank you, sir. You may
[21] step down.
[22] Counselor, do you have another witness?
[23] **MR. POPPE:** My colleague Ms. Zheng Liu
[24] does, your Honor.
[25] **JUDGE ZIEGLER:** Would you come forward,

[1] And then I became an assistant professor at
[2] Harvard medical school until early this year in
[3] February 2007. This year, I joined University of
[4] California, San Diego, to become an associate
[5] professor with tenure and also director of research at
[6] the department of oncology.
[7] **Q** Do you have any specific experience in
[8] respiratory gating?
[9] **A** Yes.
[10] I do have a lot of experience in
[11] respiratory gating.
[12] And also motion management.
[13] Because that has been my research focus
[14] since year 2000.
[15] And I have published about -- in my whole
[16] career, I have published about I think more than 60
[17] peer reviewed journal papers, about 50 percent of that
[18] are in field of respiratory gating and motion
[19] management.
[20] And also in the past two years, I have
[21] given I think about 35 invited talks all over the
[22] world.
[23] And all of them are in this field.
[24] **Q** Do you have any experience with computer
[25] software programming?

Page 154

Page 156

[1] sir.
[2] **DR. STEVE JIANG**
[3] called as a witness by the defendant, having been
[4] first duly sworn, as hereinafter certified, was
[5] examined and testified as follows:
[6] **JUDGE ZIEGLER:** State your name.
[7] **THE WITNESS:** Steve Jiang.
[8] **JUDGE ZIEGLER:** Spell your last name?
[9] **THE WITNESS:** J-I-A-N-G.
[10] **DIRECT EXAMINATION**
[11] **BY MS. LIU:**
[12] **Q** Dr. Jiang, please speak loudly so the court
[13] reporter can record what you say.
[14] **JUDGE ZIEGLER:** And keep your voice up,
[15] please.
[16] **THE WITNESS:** Sure.
[17] **Q** Dr. Jiang, briefly explain your
[18] professional experience starting from your Ph.D.
[19] training?
[20] **A** Sure.
[21] I got my Ph.D. in medical physics in 1998
[22] from Medical College of Ohio.
[23] And then after that, I went to Stanford
[24] University, received my post doctoral training for two
[25] years.

[1] **A** Yes.
[2] I started to write computer software about
[3] 20 years ago.
[4] And since then it has been very important
[5] part of my research.
[6] So I do have a lot of experience.
[7] **Q** So you have -- do you have a good
[8] understanding of algorithm and how algorithms
[9] function?
[10] **A** Yes.
[11] **Q** Exhibit A, attached to the No. 2 in the
[12] folder is a document.
[13] Dr. Jiang, is this an updated copy of your
[14] CV?
[15] **A** It is updated until August.
[16] **MS. LIU:** Your Honor, we move the CV in to
[17] evidence.
[18] **MR. JOHNSON:** No objection.
[19] **JUDGE ZIEGLER:** Admitted.
[20] **MS. LIU:** Also move to qualify Dr. Jiang as
[21] an expert in the field of respiratory gating.
[22] **JUDGE ZIEGLER:** Mr. Johnson, any questions?
[23] **MR. JOHNSON:** For purposes of this hearing,
[24] I have no questions and no objection.
[25] **JUDGE ZIEGLER:** Motion granted.

Page 157

Page 159

[1] BY MS. LIU:

[2] Q Dr. Jiang, do you have a copy of the '554
[3] patent?

[4] A I do.

[5] Q Have you reviewed this patent?

[6] A Yes.

[7] I have.

[8] Q Have you formed an opinion, on what is the
[9] technical field of the '554 patent?

[10] A Yes.

[11] I have.

[12] In my opinion, the technical field includes
[13] medical physics and computer vision.

[14] Q Have you formed an opinion on the level of
[15] education and experience that a person of ordinary
[16] skill in the art would have had in 1996?

[17] A Yes.

[18] I have.

[19] Q What is your opinion?

[20] A My opinion is there are two types of people
[21] can be qualified as a person of ordinary skill in the
[22] art in 1996.

[23] The first type is a person with a master's
[24] degree in medical physics and some years of
[25] professional experience in computer vision.

[1] And second type is a person with a
[2] bachelor's degree in computer vision and some years of
[3] medical physics experience.

[4] Q Why do you think a person of ordinary skill
[5] in the art would have that combination and level of
[6] experience?

[7] A That is because this patent '554 is all
[8] about to use computer vision techniques to solve
[9] radiotherapy problem.

[10] Q Was the concept of gating, turning
[11] radiation beam on and off following the patient's
[12] breathing, was that concept known to the research
[13] community in 1996?

[14] A Yes.

[15] Q Was there any known techniques for
[16] respiratory gating prior to the finding of this '554
[17] patent?

[18] A Yes.

[19] Q Would you please describe these techniques?

[20] A There were a few publications before
September 1996.

[22] One work was published by a Finnish medical
physicist in 1986.

[24] And then around the same time he also filed
a patent in Finland.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 161

[1] not the invisible part of the light spectrum.
 [2] Q Can the natural fiducials be seen under
 [3] visible light?

[4] A Yes.

[5] Visible light.

[6] Yes.

[7] Q Can natural fiducials be seen under
 [8] invisible light spectrums?

[9] A It cannot.

[10] In theory, you can use camera to get some
 [11] signal of invisible light.

[12] But the signal is so weak, it is totally
 [13] useless.

[14] I don't believe a person of ordinary skill
 [15] in the art will think this camera will capture
 [16] invisible light and use that to track the patient
 [17] movement.

[18] Q Can you also still look at claim 20, and
 [19] there is another phrase called means -- starts with
 [20] means determining movement?

[21] A Yes.

[22] Q Have you formed an opinion whether the
 [23] patent specification describes a structure that
 [24] corresponds to the means determining movement of said
 [25] patient from said digital image signals?

Page 161

[1] patient and for the current treatment decision under
 [2] the current condition.

[3] Then the third step -- then you track the
 [4] fiducial in new image.

[5] That is box 140.

[6] And during this process you may find the
 [7] fiducial is lost.

[8] So that is the box 150.

[9] You have to have an algorithm to see if the
 [10] fiducial is lost or not.

[11] If the fiducial is lost, then you have to

[12] reacquire the fiducial in the image in a larger image.

[13] That is the box 180.

[14] Those are the five major algorithms.

[15] Five major steps for this whole tracking

[16] process.

[17] Q The steps you described and defined by the
 [18] algorithm, are there any that are necessary to perform
 [19] the function of determining movement of the patient
 [20] from the digital image signals?

[21] A Yes.

[22] Q What are they?

[23] A All of them are necessary.

[24] Q Why are all of them necessary?

[25] A Because as I mentioned before, the patent

Page 162

Page 164

[1] A Yes.

[2] Q What is the structure?

[3] A The structure is a computer process that is
 [4] programmed with computer algorithms to track the
 [5] fiducial movements and therefore track the patient
 [6] movements.

[7] Q What are the algorithms you refer to?

[8] A The algorithms are described in the patent
 [9] using flow charts, also of course in the text.

[10] The flow charts are from figure 6 all the
 [11] way up to figure 16.

[12] Q Is there any major steps defined by the
 [13] algorithm?

[14] A Yes.

[15] If you look at figure 6.

[16] This is the figure that describes the whole
 [17] process.

[18] Including several algorithms.

[19] And in my opinion, there are five major
 [20] steps.

[21] The first one is detect the fiducials on
 [22] the patient body using current camera image.

[23] So that is step 1.

[24] And after you detect fiducials, then you
 [25] can fine tune the tracking templates for the current

[1] uses regular video camera.

[2] And under varying lighting condition, and

[3] also the fiducials may have different shape and
 [4] different size, different appearance, which it says in
 [5] the patent, therefore, you need all these algorithms
 [6] to be able to track the fiducials.

[7] Q Did you create an animation to --

[8] A Yes.

[9] I helped create an animation to explain
 [10] this part of the process.

[11] If I may show the animation.

[12] JUDGE ZIEGLER: Fine.

[13] A So this is a patient lying on the treatment
 [14] couch.

[15] And for this patient, assume we have two
 [16] artificial fiducials here and here.

[17] And then there is natural fiducial which is
 [18] a scar.

[19] And then we have a mole here, which has an
 [20] appearance similar to the artificial fiducials.

[21] And when the patient breathes in and

[22] breathes out, so if you can stop here, then you can
 [23] see these are the fiducials can move closer to each

[24] other or move away from each other.

[25] So they don't have a relationship with each

Page 165

Page 167

[1] other.

[2] And then using the camera attached to the
 [3] treatment machine, we can capture two dimensional gray
 [4] scale image of the patient.

[5] In the image we do have fiducial markers
 [6] here.

[7] And if you can stop here, so as stated in
 [8] the patent, this technology is going to be used under
 [9] different lighting conditions.

[10] So in the regular radiotherapy treatment
 [11] zoom, you have different sets of lights like regular
 [12] lighting condition like this.

[13] Sometimes we turn on all lights.

[14] Sometimes we turn some of them on.

[15] Sometimes we turn them off in order to see. So
 [16] different conditions there.

[17] And under common condition like this, the
 [18] brightness of the fiducials are very similar to
 [19] that -- is very similar to that of the background,
 [20] which is patient body and treatment equipment and the
 [21] zoom itself.

[22] So therefore, it is difficult to track the
 [23] fiducials, to detect the fiducials first, and to track
 [24] them under different lighting conditions.

[25] And therefore, we need algorithms to

[1] fiducial, which is the mole here.

[2] And find the true fiducial.

[3] Then you can obtain more realistic template
 [4] for this treatment for this patient.

[5] That is called a fine tuning of the
 [6] template.

[7] And that is an important step of the
 [8] algorithm.

[9] **Q** Dr. Jiang, is this animation represents
 [10] what you understand for the phrase "means determining
 [11] movement of patient from digital image signals" to be?

[12] **A** Yes.

[13] This animation explains the -- if you look
 [14] at figure 6 in the patent, it explains 1, 2, which is
 [15] 110 and 120, two boxes.

[16] **Q** What are the key features of the algorithms
 [17] as described in the patent you just showed all these
 [18] steps in the animation.

[19] What are the key features?

[20] **A** The key features, like I mentioned,
 [21] normalized correlation, template matching, different
 [22] levels of resolution.

[23] Featuring all key features.

[24] **Q** Why do you consider them to be key
 [25] features?

Page 166

Page 168

[1] perform this task.

[2] So the first step is to downgrade the image
 [3] in to low resolution.

[4] And then you can do so called rester
 [5] scanning, using initial idealized template from in
 [6] previous days or different patient.

[7] When I say rester scanning, meaning scan
 [8] from left to right, up and down, and you can skip
 [9] some.

[10] They can identify some candidates for
 [11] fiducials. In

[12] This case, we found three candidates. This
 [13] is a mole.

[14] Then you do this for other fiducials like
 [15] the natural fiducial.

[16] And then you can detect the scar here, as a
 [17] natural fiducial.

[18] After that, the next step you go back to
 [19] high resolution mode.

[20] And then you perform a series of operations
 [21] including normalized correlation.

[22] Sparse sampling again.

[23] And bracketing and interpolation.

[24] And minimal separation.

[25] After that, you can remove the false

[1] **A** Because you need them to track -- detect
 [2] the fiducials and track them under the different light
 [3] conditions and also different appearance and shape of
 [4] the fiducials.

[5] **Q** Would you please take a look at claim 21,
 [6] please?

[7] In the third sentence, did you see a phrase
 [8] "fiducial on said patient"?

[9] **A** Yes.

[10] **Q** Have you formed an opinion regarding what a
 [11] person of ordinary skill in the art would understand
 [12] the term "fiducial on said patient" to be in 1996?

[13] **A** The understanding of the person of ordinary
 [14] skill in the art would be fiducials are both natural
 [15] and artificial are attached to the patient body,
 [16] individually.

[17] **Q** Why do you believe that the fiducials are
 [18] attached to the patient's body, individually?

[19] **A** Well, if you look at the figure 2.

[20] And also figure 5.

[21] You can see fiducials are individually
 [22] attached to the patient's body.

[23] And also it was common practice to do so
 [24] around 1998.

[25] Like I mentioned, this work from the group,

Page 169

Page 171

[1] they did similar work, fiducial markers attached to
[2] the patient's body.

[3] Also, I am aware of work done by Harvard
[4] medical school, Dr. New.

[5] He did similar work around that time.

[6] He got a Whitaker grant for that work. It
[7] is the same idea.

[8] Attach fiducial markers individually on
[9] patient body.

[10] Also I believe there is reason for that,
[11] why people did that around that time.

[12] The reason is they try to capture different
[13] movement of the different parts of the body.

[14] Therefore, they don't want to have rigid
[15] relationship or mounted fiducial markers.

[16] That is why I think ordinary -- person of
[17] ordinary skill in the art in 1996 would think
[18] fiducials are attached to the body, individually.

[19] Q Is there anywhere in the specification
[20] described that the fiducials are individually
[21] attached?

[22] A There are places.

[23] I can point to one.

[24] If you look at column 3, line 65.

[25] So there you see, "It is advantageous to

[1] Meaning we are going to treat the patient
[2] at this point.

[3] Turn on the beam.

[4] And now when the patient breathes in, the
[5] fiducials will move outwards.

[6] So when the distance of the fiducials
[7] exceed the first tolerance, then we color fiducials in
[8] yellow, meaning we will generate a warning signal.

[9] But we still treat the patient at this
[10] time.

[11] So now if the patient breathes in, at this
[12] point fiducials are in red, meaning they are too far
[13] away from the treatment position.

[14] So we should not turn on the beam at this
[15] point.

[16] That is why we turn them in red.

[17] And you see we need to develop algorithms
[18] to record and compare different spatial patterns of
[19] the fiducials in order to be able to detect the
[20] breathing signal to generate signal. See how it
[21] works.

[22] And here if you stop here, you see green
[23] and yellow and red similar to the traffic lights.

[24] This is mentioned in the patent.

[25] If you look at figure 5 in the patent.

Page 170

Page 172

[1] provide multiple fiducials placed on the patient so as
[2] to detect any movement of the critical locations."

[3] Meaning you want to attach fiducials
[4] individually to get any movement of critical
[5] locations.

[6] Different parts of the body.

[7] Q Did you create an animation?

[8] A There is another animation showing this.

[9] So in this we have four artificial
[10] fiducials. And one mole.

[11] Patient breathes in, breathes out, how the
[12] fiducials move relative to each other.

[13] And then stop here.

[14] So this is the end of exhale, when the
[15] patient breathes out, they tend to stay there a little
[16] bit longer.

[17] So this is the most stable and reproducible
[18] phase for most of the patients.

[19] This was discovered by Dr. James Balter
[20] many years ago.

[21] Since then common practice in our field is
[22] to treat the patient at this particular breathing
[23] phase.

[24] In this case, we colored fiducials in
[25] green.

[1] You have three different colors it says in
[2] the text.

[3] Similar to traffic lights.

[4] Also in the text, column 5.

[5] So there you also see the same thing about
[6] the traffic light, how you convert the spatial pattern
[7] change in to this traffic light kind of signal.

[8] If you continue.

[9] Now from the spatial pattern change, we can
[10] generate this kind of signal.

[11] And this signal, when it is in yellow or
[12] green area, you turn on the radiation beam.

[13] So this is how it works based on the
[14] understanding of a person of ordinary skill in the art
[15] in 1996.

[16] Q Dr. Jiang, would you please show the board
[17] where in the specification describes the algorithm you
[18] just explained?

[19] A That would be in figure 16.

[20] You can see there it mentions -- compares
[21] spatial pattern of the actively tracked fiducials.

[22] This box.

[23] Q Is there anywhere in the specification
[24] describing the traffic lights you were just
[25] mentioning?

Claim Construction Hearing
November 29, 2007

Page 173

Page 175

[1] **A** Figure 5 also in text, that would be column
[2] 5 from line 4 to line 13.

[3] That paragraph.

[4] Also in paragraph -- column 4. Go to
[5] column 4.

[6] The last paragraph. It also describes.
[7] Just reading this right now.

[8] The whole paragraph is talking about
[9] traffic lights, if you read it.

[10] It says here traffic light turns red.

[11] **Q** So was the animation you just showed the
[12] court, does that animation represent what you
[13] understand of the algorithm to mean?

[14] **A** Yes.

[15] **Q** Is there anywhere in the patent describing
[16] fiducials that are not individually attached?

[17] **A** No.

[18] **MS. LIU:** No further questions.

[19] **JUDGE ZIEGLER:** Cross examine.

CROSS EXAMINATION

[21] **BY MR. JOHNSON:**

[22] **Q** You just said there is nowhere in the
[23] patent that describes fiducials that are not
[24] individually attached.

[25] Is that right?

[1] variety of ways.

[2] Can't you?

[3] **A** Yes.

[4] **Q** And enumerate them for his Honor?

[5] **A** You can place them individually on the
[6] patient's body.

[7] Also you can place them on like a carrier.

[8] Then put a carrier on the body of the patient,
[9] therefore they have a rigid relationship.

[10] **Q** Both would be on the patient.

[11] Correct?

[12] **A** Right.

[13] **Q** Both would enable you to practice the
[14] patent by tracking movement.

[15] Correct?

[16] **A** Correct.

[17] **Q** Now, you told us, I believe, that the
[18] camera had to be a video camera.

[19] **A** I think it said in the patent it is a video
[20] camera.

[21] **Q** It doesn't say it has to be a video camera
[22] in the patent.

[23] Does it?

[24] **A** It says -- it doesn't say it has to be
[25] video camera.

Page 174

Page 176

[1] **A** That's correct.

[2] **Q** Let's take a look at the claim, if you
[3] will.

[4] And let's go to claim 21.

[5] I would like you to highlight the third
[6] line, if you will, "At least one fiducial on said
[7] patient".

[8] See that language?

[9] **A** Yes.

[10] **Q** That language doesn't say physically
[11] attached on said patient.

[12] Does it?

[13] **A** No.

[14] **Q** And let's go back to your column No. --
[15] that you looked at.

[16] I believe it is column 3, line 65.

[17] I think you went over to column 4.

[18] **A** Yes.

[19] **Q** And let's highlight the language 65 through
[20] 67.

[21] It talks about multiple fiducials placed on
[22] the patient.

[23] Correct?

[24] **A** Yes.

[25] **Q** You can place fiducials on the patient in a

[1] But it says it is a video camera.

[2] **Q** I wanted you to help me out here.

[3] Let's go to column 4.

[4] And if we go up to about line 7.

[5] It says figure 4.

[6] It says, "Figure 4 is a functional diagram
[7] of the invention. The cameras 35 capture an image of
[8] the fiducials on the patient reclining on the patient
[9] positioning assembly 23. The image captured by the
[10] camera is digitized by digitizer 45 to generate
[11] digital image signals."

[12] Then it talks about the gray scale for each
[13] camera pixel.

[14] Is that correct?

[15] **A** Yes.

[16] **Q** Can you show me where it says that camera
[17] has to be a video camera?

[18] **A** I don't know any other type of camera. If
[19] camera is used to generate gray scale image, that is
[20] video camera, in my opinion.

[21] **Q** Can you convert the gray scale using a
[22] digitizer?

[23] **A** Yes.

[24] **Q** Now, you were aware of the existence of
[25] digitizers that could be used to convert to gray

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 177

[1] scale, weren't you, back in 1996?
 [2] **A** Yes.
 [3] **Q** I would like you to go to column 2, if you
 [4] will.
 [5] Just spend a second on gating.
 [6] And let's go up to lines 13 through 21.
 [7] It says that, "Another aspect of the
 [8] invention, the means determining movement of the
 [9] passive fiducials includes means detecting movement
 [10] associated with patient breathing and random
 [11] movement.
 [12] "The movement associated with patient
 [13] breathing can be used to generate a gating signal
 [14] synchronized to patient breathing.
 [15] "This gating signal can then be used to
 [16] actuate the beam generator only during selected parts
 [17] of the breathing cycle."
 [18] Have I read that correctly?
 [19] **A** Yes.
 [20] **Q** If I understand it, this gating signal
 [21] allows you to actuate this beam generator, so that the
 [22] beam will either be on or off.
 [23] Correct?
 [24] **A** Correct.
 [25] **Q** That is what it does?

[1] they are working together.
 [2] **Q** Did you look at the individual claims?
 [3] Again, I will direct you to claim 20.
 [4] Which is found on column 10.
 [5] If we are looking at this processing means,
 [6] there is a reference, is there not, line 49 to gating
 [7] means generating gating signals synchronized with said
 [8] movement associated with breathing by said patient.
 [9] Do you see that?
 [10] **A** Yes.
 [11] **Q** That gating signal referred to there is not
 [12] an alarm.
 [13] Is it?
 [14] **A** No.
 [15] I don't think so.
 [16] **Q** And it is true, is it not, there is no
 [17] reference to the alarm in this particular claim?
 [18] **A** True.
 [19] **Q** You are not telling us, are you, that that
 [20] gating signal requires an alarm to satisfy the
 [21] elements of claim 20.
 [22] Are you?
 [23] **A** No.
 [24] **Q** Thank you.
 [25] You told us that the camera required

Page 178

[1] **A** Yes.
 [2] **Q** Now, there are a variety of ways that will
 [3] enable one to turn the beam generator on or off.
 [4] Correct?
 [5] **A** Correct.
 [6] **Q** And there were different approaches known
 [7] to accomplish that result back in 1996.
 [8] Correct?
 [9] **A** True.
 [10] **Q** Now, you understood from the patent, did
 [11] you not, there was a difference between an alarm and a
 [12] gating signal?
 [13] **A** Yes.
 [14] **Q** And that difference is that the gating
 [15] signal actuates the beam generator and an alarm can
 [16] either be visual or audible, if something bad happens
 [17] during the process.
 [18] Right?
 [19] **A** That's right.
 [20] **Q** So the two are different.
 [21] **A** That's right.
 [22] **Q** Now, you are not contending, are you, that
 [23] an alarm and a gating signal have to work together for
 [24] purposes of practicing the patent?
 [25] **A** Based on the way the patent is written,

[1] visible light.
 [2] **A** Right.
 [3] **Q** There is nothing in this patent that makes
 [4] a reference to visible light.
 [5] Is there?
 [6] **A** What is in the patent exactly, if you look
 [7] at figure 1.
 [8] This is like a common setup.
 [9] They don't have spatial invisible light
 [10] source.
 [11] Without spatial invisible light source such
 [12] as the one used in prior art, they cannot get image of
 [13] invisible light using the camera like CCD camera.
 [14] So I would think a person of ordinary skill
 [15] in the art in 1996 would think you can't use any
 [16] invisible light.
 [17] It has to be visible light.
 [18] **Q** Well, they are using x-rays.
 [19] Aren't they?
 [20] **A** To treat the patient.
 [21] **Q** To treat the patient?
 [22] **A** Not to track the motion.
 [23] **Q** But they are also using x-rays to grab a
 [24] portal image, aren't they, as part of the process?
 [25] **A** In that case, yes, that is true.

[11] In that case, portal image is detector. In
[12] this case, it is camera is the detector.

[13] Q My question to you, sir, you understood
[14] that the entire assembly, let's look at one, if we
[15] have one here, if we look at just the front of the
[16] patent.

[17] There is a picture at the bottom or figure
[18] 1, whichever is easier.

[19] That is the apparatus we are talking about,
[20] isn't it?

[21] A That's correct.

[22] Q And they were using -- we are capturing
[23] images of x-rays, correct?

[24] A Using the camera?

[25] No.

[26] Incorrect.

[27] Q I am asking you for purposes of this
[28] apparatus, are you capturing x-ray images?

[29] A For this patent to track the patient
[30] movement?

[31] Q No.

[32] Just generally.

[33] Generally using this apparatus to treat a
[34] patient, you are going to capture x-ray images.

[35] Aren't you?

[11] Q I am talking about to somebody of ordinary
[12] skill in the art.

[13] A Yes.

[14] Q And so therefore, somebody of ordinary
[15] skill in the art would understand if they needed to
[16] add this infrared for purposes of capturing images, it
[17] could easily do so?

[18] A That is another piece of equipment.

[19] Q Also for the fiducial markers, you
[20] described in the patent don't work, because fiducial
[21] markers have Lambertian surface. You need reflective
[22] surface in order to use that light source to capture
[23] motion.

[24] Q But it is true, is it not, that one of
[25] ordinary skill would have no difficulty using an
[26] infrared ring or some other application to view
[27] infrared images?

[28] A It is true.

[29] Q And it is also true that there is nothing
[30] in this patent that says you can't do that, is there?

[31] A In this patent, it says it does not have
[32] that critical piece.

[33] Q Also, it has one fiducial marker, so you
[34] cannot do that in practice.

[35] Q Isn't it true that the claim says "at least

[11] A I would say yes.

[12] If you use a machine like this, you can
[13] capture x-ray images using the portal imager.

[14] Q Did you look at the file history in your
[15] review?

[16] A Yes.

[17] Q Did you see where the examiner was relying
[18] on prior art that used a camera that could capture
[19] infrared images?

[20] A I look at it very briefly, yes.

[21] Q But you understood that was part of the
[22] prior art that the examiner relied on to define
[23] cameras, including something that captured infrared?

[24] A I understand the camera used in the prior
[25] art is the same camera.

[26] However, they also have additional piece.

[27] That is the infrared light source, which is very close
[28] to the camera.

[29] Without that kind of lighting source, the
[30] cameras cannot be used for infrared.

[31] Q Sir, two questions.

[32] First of all, the use of this infrared
[33] light source was well known in 1996.

[34] Correct?

[35] A In prior art, yes.

[11] one", and there may be multiple markers?

[12] A Yes.

[13] Q So you understand that you can have more
[14] than one marker?

[15] A Right.

[16] Q And you understand that because you can
[17] have more than one marker, there may be different
[18] images you may need to acquire?

[19] A It says in the patent they are all same
[20] type of artificial fiducial markers.

[21] They have the same surface.

[22] Q One last point.

[23] There is a difference between an artificial
[24] fiducial and a natural fiducial.

[25] Correct?

[26] A Correct.

[27] Q And tell the judge what that difference is?

[28] A The difference is an actual fiducial marker
[29] based on this patent is part of the patient's skin,
[30] like a scar.

[31] Unnatural fiducial is something like an
[32] object you made with spatial shape, like circle shape
[33] and place that, attach that to patient's body.

[34] Q And somebody of ordinary skill in the art,
[35] you understand, do you not, a fiducial can be either

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 185

Page 187

[1] natural or artificial?

[2] **A** Yes.

[3] **Q** So when you look at, for example, claim 21,
[4] we were just there, where it says at least one
[5] fiducial, you would agree with me that means it could
[6] either be unnatural or an artificial fiducial, isn't
[7] that right?

[8] **A** True.

[9] **Q** Nothing further.

[10] **JUDGE ZIEGLER:** Any rebuttal or redirect?

[11] **MS. LIU:** A few questions.

[12] **JUDGE ZIEGLER:** Go right ahead.

[13] **REDIRECT EXAMINATION**

[14] **BY MS. LIU:**

[15] **Q** Dr. Jiang, is there a rigid carrier
[16] disclosed anywhere in the patent?

[17] **A** No.

[18] **Q** According to your expert opinion, does the
[19] algorithm contemplate the use of a rigid carrier for
[20] fiducials?

[21] **A** No.

[22] The algorithm was designed to track the
[23] fiducials, because we were talking about a lot of
[24] things, to track -- how to track them individually.
[25] If they are rigidly attached, the algorithm will be

[1] **A** The algorithm requires fiducial markers and
[2] also using camera to track the fiducial markers.

[3] **Q** The fiducial markers disclosed in this
[4] patent, are they x-ray opaque fiducials?

[5] **A** It can be opaque.

[6] It cannot.

[7] Either way is fine.

[8] So the patent did not specifically say
[9] anything about the fiducial.

[10] **Q** For claim 21 earlier, counsel highlighted
[11] the phrase "at least one fiducial on said patient".

[12] And counsel asked you whether there were
[13] any specific mentioning of this in this sentence
[14] whether individually placed.

[15] Do you remember that question?

[16] **A** I do.

[17] **Q** What would a person of ordinary skill in
[18] the art looking at a claim and the patent understand
[19] what a fiducial on said patient to be?

[20] **A** It would be fiducials with lambertian
[21] surface.

[22] That is the artificial fiducials.

[23] Also can be natural fiducials.

[24] **Q** Are they individually attached?

[25] **A** Yes.

Page 186

Page 188

[1] much simpler, in my opinion.

[2] **Q** Was there any mentioning of infrared light
[3] in the specification?

[4] **A** No.

[5] **Q** Was there any mentioning of any other --
[6] using any other invisible light source in the
[7] specification?

[8] **A** No.

[9] **Q** Counsel just asked you a question about
[10] using the assembly, figure 1.

[11] Counsel asked you for this linear
[12] accelerator, whether it is possible for the
[13] electrical -- electric portal imager to capture an
[14] image of x-ray.

[15] **MR. JOHNSON:** Objection. Misstates my
[16] question.

[17] **JUDGE ZIEGLER:** Overruled.

[18] **Q** Do you remember that question?

[19] **A** I do.

[20] **Q** So for this setup disclosed in the patent,
[21] if you use the electric portal imager to capture x-ray
[22] image, was that for the purpose of -- that was
[23] contemplated by the algorithm?

[24] **A** No.

[25] **Q** So what does the algorithm require?

[1] Individually attached on the surface.

[2] **MS. LIU:** No more questions.

[3] **JUDGE ZIEGLER:** Anything further?

[4] **MR. JOHNSON:** Nothing.

[5] **JUDGE ZIEGLER:** Thank you.

[6] You may step down.

[7] It is 12:30.

[8] What is your pleasure?

[9] **MR. ANTHONY:** What is your pleasure?

[10] **JUDGE ZIEGLER:** We completed Varian's
[11] presentation.

[12] Mr. Johnson is entitled to rebuttal. Do
[13] you present rebuttal?

[14] **MR. JOHNSON:** I do.

[15] **JUDGE ZIEGLER:** Let's recess for lunch for
[16] one hour.

[17] ---
[18] (Thereupon, a luncheon recess was taken
[19] from 12:35 o'clock p.m. until 1:35 o'clock p.m.)

[20] ---
[21]

[22]

[23]

[24]

[25]

Page 189

Page 191

[1] A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

[2] **JUDGE ZIEGLER:** Mr. Johnson, you may
[3] proceed, if you are ready.

[4] **MR. JOHNSON:** Dr. Schell, please.

[5] **REDIRECT EXAMINATION**

[6] **BY MR. JOHNSON:**

[7] **Q** Dr. Schell, you were here this morning and
[8] heard the testimony concerning need for the use of all
[9] of the algorithms in the '554 patent.

[10] Do you recall that testimony?

[11] **A** Yes.

[12] I did.

[13] **Q** And do you agree with it?

[14] **A** I agree to the extent that that particular
[15] flow chart design, those steps are necessary.

[16] Basic algorithm is in figure 4.

[17] **Q** Let's put figure 4 up for the court.

[18] **A** Patient motion detection and gating signal
[19] generator.

[20] But the problem is one could design other
[21] flow chart designs to achieve the same goal.

[22] Other algorithms.

[23] So the essence of the patent is figure 4.

[24] And the flow charts that follow are one example of
[25] achieving those goals.

[1] spectrum?

[2] **A** That is not necessarily true.

[3] **Q** Tell me why.

[4] **A** There is examples of infrared cameras that
[5] were in use to track surgical instrumentation in the
[6] early '90s.

[7] These infrared cameras had infrared lamp
[8] source to illuminate infrared markers to follow the
[9] motion of the instrument in question.

[10] It was later applied to the brain lab exact
[11] tracks system.

[12] So that you have two cameras, infrared,
[13] looking at fiducial markers.

[14] The infrared lamps in each camera were
[15] irradiating markers.

[16] And you could track those markers and infer
[17] where the tumor position is.

[18] At the time of the patent.

[19] **MR. JOHNSON:** Nothing further.

[20] **JUDGE ZIEGLER:** Any questions, counselor?

[21] **MR. POPPE:** No.

[22] **JUDGE ZIEGLER:** No questions.

[23] You are excused.

[24] Thank you.

[25] **MR. JOHNSON:** Now it is time to argue the

Page 190

Page 192

[1] **Q** And let's turn to the '431 patent.

[2] I will ask you the same question.

[3] You heard the testimony concerning the use
[4] of all of the steps of the algorithms in order to
[5] practice the patent.

[6] **A** Yes.

[7] I did.

[8] **Q** And did you agree with that conclusion?

[9] **A** I agree to the extent that again, that the
[10] steps listed are necessary.

[11] But there is other ways to achieve figure
[12] 1.

[13] **Q** And you have on the screen figure 1.

[14] **A** Coarse and fine alignment.

[15] **Q** And why is this significant?

[16] **A** Well, because the algorithm of the patent
[17] is coarse alignment, fine alignment to achieve the
[18] goals of the patent application for matching x-ray
[19] images with reference images.

[20] But it is conceivable to design different
[21] approaches to achieve the same goal.

[22] **Q** Now, there was testimony about whether or
[23] not in the -- I think it is the '431.

[24] The camera had to be -- I am sorry, '554,
[25] the camera had to be a video camera on visual

[1] terms.

[2] **JUDGE ZIEGLER:** All right.

[3] We discussed the order. Varian proceeds
[4] first.

[5] You proceed last.

[6] Is that correct?

[7] **MR. JOHNSON:** That works for me.

[8] **JUDGE ZIEGLER:** That was my recollection of
[9] the conference call.

[10] Mr. Sneath, what is your recollection?

[11] **MR. SNEATH:** That is right.

[12] **JUDGE ZIEGLER:** Who will argue?

[13] **MR. POPPE:** It will be a tag team affair.

[14] But I will start, if that is all right.

[15] **JUDGE ZIEGLER:** Very good.

[16] **MR. JOHNSON:** Do I get extra points because
[17] I have to go it alone?

[18] **JUDGE ZIEGLER:** You can have extra people,
[19] not extra points.

[20] **MR. JOHNSON:** No points. All right.

[21] **MR. POPPE:** Actually, we will help you
[22] out.

[23] **MR. JOHNSON:** Why am I sure I don't want
[24] that?

[25] **MR. POPPE:** If you could bring up the

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 193	Page 195
<p>[1] algorithm slides.</p> <p>[2] MR. ANTHONY: If we do run short, would it</p> <p>[3] be okay to rely on the brief?</p> <p>[4] JUDGE ZIEGLER: Of course.</p> <p>[5] If you need a few extra minutes, it will be</p> <p>[6] granted.</p> <p>[7] MR. POPPE: Your Honor, we are not going to</p> <p>[8] attempt to address every single claim term.</p> <p>[9] Many of them we think are adequately</p> <p>[10] covered by the briefs.</p> <p>[11] We are going to --</p> <p>[12] JUDGE ZIEGLER: I agree.</p> <p>[13] MR. POPPE: We will focus on some</p> <p>[14] particular terms, where we think additional</p> <p>[15] elucidation would be helpful.</p> <p>[16] JUDGE ZIEGLER: Okay.</p> <p>[17] MR. POPPE: I will start by addressing a</p> <p>[18] topic that is sort of an overarching topic.</p> <p>[19] It relates or it has implications for</p> <p>[20] really every single claim that has been asserted</p> <p>[21] in this case in both patents.</p> <p>[22] And it is the topic that you have already</p> <p>[23] been sort of previewed about.</p> <p>[24] Namely algorithms and how means plus</p> <p>[25] function terms must be interpreted, when</p>	<p>[1] structure is a process or computer chip</p> <p>[2] programmed to perform the algorithm described in</p> <p>[3] the patent.</p> <p>[4] However, there really wasn't very much of a</p> <p>[5] description of the algorithm in the patent at</p> <p>[6] issue in this case, so the court didn't have</p> <p>[7] occasion to address the specificity issue we have</p> <p>[8] here.</p> <p>[9] However, there have been subsequent cases</p> <p>[10] that shed light on the analysis that is</p> <p>[11] appropriate.</p> <p>[12] One of those is a case that has really</p> <p>[13] broad application.</p> <p>[14] This isn't specific to software cases. But</p> <p>[15] it has application to software cases.</p> <p>[16] It is the rule stated, for example, in</p> <p>[17] default proof credit card systems. Federal</p> <p>[18] circuit case from 2005. That corresponding</p> <p>[19] structure must include all structure that</p> <p>[20] actually performs the recited function.</p> <p>[21] Now, when you apply this principle to the</p> <p>[22] software arena, we have several cases that apply.</p> <p>[23] In applying those, this is how we see the</p> <p>[24] differentiation between the parties' position.</p> <p>[25] We believe Varian has followed the</p>
Page 194	Page 196
<p>[1] identifying the corresponding structure in a</p> <p>[2] software related claim.</p> <p>[3] I am a little stuffed up.</p> <p>[4] So if you have trouble understanding me,</p> <p>[5] let me know.</p> <p>[6] I will repeat myself.</p> <p>[7] So the parties agree that there are</p> <p>[8] algorithms that are the focus or part of the</p> <p>[9] focus of each of these claims.</p> <p>[10] The parties agree there is at least one</p> <p>[11] means plus function term in each of those claims</p> <p>[12] that corresponds to an algorithm, and for which</p> <p>[13] the corresponding structure is an algorithm.</p> <p>[14] And the dispute between the parties really</p> <p>[15] is not about whether there is an algorithm at</p> <p>[16] all.</p> <p>[17] But the extent and the degree of</p> <p>[18] specificity with which the algorithm must be</p> <p>[19] identified for purposes of identifying that</p> <p>[20] corresponding structure.</p> <p>[21] So the first case that kind of addressed</p> <p>[22] this topic generally was WMS Gaming.</p> <p>[23] It was a federal circuit case that held</p> <p>[24] generally that when a means plus function term</p> <p>[25] relates to software, that the corresponding</p>	<p>[1] principle enunciated in default proof credit card</p> <p>[2] systems by identifying all the structure needed</p> <p>[3] to perform the stated functions.</p> <p>[4] We have done that by identifying the entire</p> <p>[5] corresponding algorithm, as identified in the</p> <p>[6] specification of the patents.</p> <p>[7] Whereas, the University of Pittsburgh has</p> <p>[8] not done that.</p> <p>[9] They have ignored large parts of the</p> <p>[10] algorithm in favor of advocating for broad labels</p> <p>[11] to characterize each of these algorithms.</p> <p>[12] And as we are going to talk about some</p> <p>[13] more, we believe case law does not permit the</p> <p>[14] University of Pittsburgh's approach but rather</p> <p>[15] favors Varian's.</p> <p>[16] So let's turn to some of these cases now.</p> <p>[17] One is a district of Minnesota case from</p> <p>[18] 2001.</p> <p>[19] And this has particular applicability here</p> <p>[20] because of the nature of the disclosure of the</p> <p>[21] patents in our case.</p> <p>[22] And what this district court case said in</p> <p>[23] Itron was the corresponding structure in software</p> <p>[24] means plus function case consists of, quote, "The</p> <p>[25] particular flow charts disclosed in the patent."</p>

Page 197

Page 199

[1] And this is applicable here, because as you
[2] have seen, each of the patents has multiple flow
[3] charts that describe the algorithms.

[4] And those are the flow charts that identify
[5] the structure corresponding to the related
[6] functions and means plus function terms.

[7] This next slide identifies a couple other
[8] cases that have discussed what a corresponding
[9] structure is. In the context of a software
[10] patent. And a software means plus function
[11] claim.

[12] The Network Caching case from northern
[13] district of California in 2002 said that the
[14] court must identify the specific routine.

[15] Similarly, the federal circuit Tehrani
[16] versus Hamilton medical in 2003 said the court
[17] must identify the precise algorithm.

[18] So there is a theme in these cases that you
[19] don't resort to broad generalities in identifying
[20] the algorithm from purposes of a means plus
[21] function claim.

[22] You are supposed to be specific.

[23] And precise.

[24] The University of Pittsburgh has relied on
[25] a couple of cases in support of its position they

[1] But what the University of Pittsburgh has
[2] ignored is the very next sentence in this case.
[3] I will show that to you now.

[4] The very next sentence said, "Specifically,
[5] the patent discloses, as corresponding structure,
[6] a processor 37," which was referring to a
[7] specific processor identified in one of the
[8] patent figures, "advantageously comprised of a
[9] pair of processors," which include a support
[10] processor 37A, and a fast array processor 37B
[11] shown in figure 4, et cetera.

[12] "Which is programmed to carry out the
[13] disclosed data recovery algorithm illustrated in
[14] several figures and described in several portions
[15] of text."

[16] What this shows the court did not stop with
[17] a broad general characterization.

[18] But it went forward and said the
[19] corresponding structure is the entirety of the
[20] figures and text describing the algorithm.

[21] Another case they would like to discuss is
[22] called Odetics versus Storage Tech Corp.

[23] This is not an algorithm case, per se.

[24] But the University of Pittsburgh has
[25] claimed that it sets forth a principle that has

Page 198

Page 200

[1] would like to discuss in a bit of detail.

[2] One is Harris Corporation versus Ericsson,
[3] Inc.

[4] A federal circuit case from 2005.

[5] The University of Pittsburgh has cited this
[6] case for the proposition that in fact, the
[7] federal circuit blesses the idea of giving a
[8] broader description to an algorithm when
[9] identifying the corresponding structure.

[10] And this is the language from that case,
[11] that they have cited.

[12] And it says, "We hold that the
[13] corresponding structure for the time domain
[14] processing means is a microprocessor programmed
[15] to carry out a two-step algorithm in which the
[16] processor calculates first generally nondiscrete
[17] estimates and then selects the discrete value
[18] closest to each estimate."

[19] What the University of Pittsburgh has said
[20] is, "Well, the patent in this case disclosed that
[21] time domain processing means algorithm in much
[22] greater detail than is described here."

[23] So this case is blessing the idea of
[24] ignoring large parts of the algorithm and simply
[25] giving it a characterization.

[1] application here.

[2] And the principle they quoted reads as
[3] follows.

[4] "The individual components, if any, of an
[5] overall structure that corresponds to the claimed
[6] function are not claim limitations.

[7] "Rather the claim limitation is the overall
[8] structure corresponding to the claimed function."

[9] University of Pittsburgh has cited this
[10] case to say because the individual portions of
[11] the structure are not claim limitations, you can
[12] ignore them.

[13] You don't need to identify them as part of
[14] the corresponding structure.

[15] But that is not what this case holds.

[16] We argued very briefly in our opposition
[17] brief that this is a principle that applies to
[18] the determination of infringement, not to claim
[19] construction.

[20] And I don't think that principle or that
[21] argument necessarily -- the import of that is
[22] self evident.

[23] So I would like to go in to more detail to
[24] explain what our position is on this.

[25] There is a principle in determining

Page 201	Page 203
<p>[1] infringement called the all elements rule.</p> <p>[2] What that says is when a patent claim has</p> <p>[3] multiple elements, in order for an accused device</p> <p>[4] to infringe, it must have each of those elements.</p> <p>[5] Either literally or by equivalence.</p> <p>[6] So I just made up a claim here.</p> <p>[7] Let's say you had a claim for an apparatus</p> <p>[8] for catching fish comprising a rod, a reeling</p> <p>[9] means, and a hook on the end of the line.</p> <p>[10] Under this all elements rule, in order for</p> <p>[11] an accused device to infringe this claim, it</p> <p>[12] would have to have each of those elements.</p> <p>[13] Either literally or by equivalence.</p> <p>[14] It is not sufficient to say that the</p> <p>[15] overall accused device is equivalent to this</p> <p>[16] overall claim.</p> <p>[17] If it has a rod and a hook but no reeling</p> <p>[18] means, either directly or by equivalence, it can</p> <p>[19] not infringe even if one might think that the</p> <p>[20] device as a whole was equivalent to this claim</p> <p>[21] device.</p> <p>[22] Let's go to the next slide.</p> <p>[23] In my hypothetical claim here, I have</p> <p>[24] intentionally had one of the elements be a means</p> <p>[25] plus function element. Namely the reeling means.</p>	<p>[1] equivalence.</p> <p>[2] And this is a requirement of that rule we</p> <p>[3] discussed earlier, that you have to, by federal</p> <p>[4] circuit precedent, identify all of the</p> <p>[5] corresponding structure disclosed in the</p> <p>[6] specification.</p> <p>[7] So let's proceed.</p> <p>[8] This is shown even more directly, when you</p> <p>[9] look at other parts of the Odetics opinion.</p> <p>[10] A prior decision in the same case by the</p> <p>[11] federal circuit had addressed the claim</p> <p>[12] construction issue.</p> <p>[13] And that process was summarized in this</p> <p>[14] Odetics opinion.</p> <p>[15] And it described the means plus function</p> <p>[16] term that was of particular relevance here.</p> <p>[17] Which was rotary means.</p> <p>[18] And there is a design of the rotary means</p> <p>[19] in the figure on the right, which came from the</p> <p>[20] patent.</p> <p>[21] And the federal circuit in Odetics</p> <p>[22] described the claim construction ruling from</p> <p>[23] earlier.</p> <p>[24] This court held the structure corresponding</p> <p>[25] to the rotary means element was the components</p>
<p>[1] So let's suppose that the specification for</p> <p>[2] this reeling means disclosed several structural</p> <p>[3] elements. Namely a housing, a plurality of gears</p> <p>[4] and a handle.</p> <p>[5] What the Odetics case would say in this</p> <p>[6] case is that to infringe, you still only need to</p> <p>[7] show that the accused device has a rod, a reeling</p> <p>[8] means, generally, and a hook on the end of the</p> <p>[9] line, in order to infringe.</p> <p>[10] When you look at those structural elements,</p> <p>[11] it may be that the accused device does not have a</p> <p>[12] housing, either directly or by equivalence.</p> <p>[13] Nevertheless, if the accused device has a</p> <p>[14] reeling means, generally that is equivalent to</p> <p>[15] that reeling means in the claim generally, it can</p> <p>[16] infringe.</p> <p>[17] The all elements rule does not apply to the</p> <p>[18] structural components of the means plus function</p> <p>[19] element.</p> <p>[20] That doesn't mean that when identifying the</p> <p>[21] corresponding structure you don't still have to</p> <p>[22] identify those structural elements.</p> <p>[23] It is particularly important that you do</p> <p>[24] so, so that you can perform a meaningful</p> <p>[25] evaluation of whether there is infringement by</p>	<p>[1] that received the force and rotate as a result of</p> <p>[2] that force.</p> <p>[3] I.e., the rod, gear and rotary loading and</p> <p>[4] loading mechanisms.</p> <p>[5] In other words, the same court that made</p> <p>[6] the statement that the University of Pittsburgh</p> <p>[7] is relying on, when earlier identifying the</p> <p>[8] structural components of that rotary means, did</p> <p>[9] not simply give an overall broad label to the</p> <p>[10] means, but went through and identified each</p> <p>[11] individual structural element.</p> <p>[12] So this is what we mean, when we say that</p> <p>[13] the claim construction ruling and the</p> <p>[14] infringement ruling are two completely different</p> <p>[15] things.</p> <p>[16] And the statement that the plaintiff is</p> <p>[17] relying on here applies only to infringement and</p> <p>[18] namely the way that the all elements rule applies</p> <p>[19] to a means plus function claim.</p> <p>[20] And not to the separate claim construction</p> <p>[21] process of identifying the corresponding</p> <p>[22] structure.</p> <p>[23] And one last point on Odetics, there was a</p> <p>[24] description in the federal circuit case talking</p> <p>[25] about the district court's mistake. What</p>

	Page 205		Page 207
<p>[1] happened in Odetics is that after the claim [2] construction ruling by the federal circuit, the [3] court remanded to the district court to [4] reconsider the question of infringement.</p> <p>[5] What the district court said was that there [6] was no infringement, because one of the [7] structural components that had been identified as [8] part of the corresponding structure, namely a [9] gear, had no corresponding element either [10] directly or by equivalence in the accused device.</p> <p>[11] And so now we get back to this statement [12] that the University of Pittsburgh is relying on.</p> <p>[13] They said, "No, that doesn't matter. You [14] don't have to have had that particular structural [15] component."</p> <p>[16] Because that is not a claim element.</p> <p>[17] You look at the overall rotary means to [18] determine whether it is the equivalent of the [19] allegedly corresponding component in the accused [20] device.</p> <p>[21] So that is what was going on.</p> <p>[22] The court was not saying that the gear was [23] not part of the corresponding structure.</p> <p>[24] Simply, you didn't -- it wasn't appropriate [25] to look at that level of detail in the</p>		<p>[1] of Dr. Schell, you heard him say that those flow [2] charts were necessary for the performance of the [3] functions.</p> <p>[4] His additional testimony was that there are [5] other algorithms that can be used to achieve the [6] same goals.</p> <p>[7] But that is not an appropriate [8] consideration in claim construction.</p> <p>[9] That might come up, when you are addressing [10] whether a particular algorithm is the equivalent [11] of the algorithms disclosed in the patents.</p> <p>[12] And you can -- you might argue in that [13] instance that while this algorithm may not have [14] every single individual element disclosed in the [15] flow charts of the patent, but on the whole, it [16] is equivalent.</p> <p>[17] But you still need to identify all of those [18] individual elements as the corresponding [19] structure, so you can properly analyze whether in [20] fact the accused algorithm is the equivalent or [21] not.</p> <p>[22] There is also another important point that [23] applies here in the context of interpreting the [24] tracking means and processing means of the '431 [25] patent.</p>	
<p>[1] infringement analysis.</p> <p>[2] So I would now like to explain how this [3] applies in the context of one of the particular [4] patent claims -- actually, two of the claims in [5] this case.</p> <p>[6] The tracking means of '431 patent claim 21.</p> <p>[7] And the processing means of '431 patent [8] claim 26.</p> <p>[9] I am not going to go in to this in much [10] detail, because you heard abundant testimony on [11] this.</p> <p>[12] But here we draw together a couple of the [13] principles that we just described.</p> <p>[14] There is the default proof credit card [15] principle that the corresponding structure must [16] include all structure that actually performs the [17] recited function.</p> <p>[18] And the Itron principle, that the [19] corresponding structure consists of the [20] particular flow charts disclosed in the patent.</p> <p>[21] And you heard testimony from Dr. Balter, [22] where he identified the steps and the flow charts [23] in the patent, that constitute the corresponding [24] structure for these two means claims.</p> <p>[25] And in fact, during the rebuttal testimony</p>	Page 206		Page 208
<p>[1] In the specification of the patent, there [2] are several statements that talk about how [3] components of the algorithm are part of the [4] invention.</p> <p>[5] Not part of an embodiment of the invention.</p> <p>[6] But part of the invention itself.</p> <p>[7] And so some particular examples of this -- [8] well, these are the three examples that are in [9] the specification.</p> <p>[10] One says an important part of the invention [11] is that robust motion flow is used to perform the [12] fine alignment.</p> <p>[13] Another statement is that the robust motion [14] is represented by data points called inliers, [15] Dr. Balter testified about this.</p> <p>[16] And in the present invention, the data [17] points are the pixel values.</p> <p>[18] So again, this is saying this part of the [19] algorithm is something that is in the invention.</p> <p>[20] Not just an embodiment.</p> <p>[21] And then finally, a statement that in [22] accordance with the invention, I think that is a [23] sigma, is lowered depending on the largest error [24] in the motion flow parameters.</p> <p>[25] The exact meaning of that statement isn't</p>			

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 209

Page 211

[1] important.

[2] What is important is this step in the
[3] algorithm is described as part of the invention.

[4] And in our brief we cited several cases
[5] that say that when you have an element that is
[6] described in the specification as a part of the
[7] invention, that you can't ignore that element.

[8] You can't just read it out of the
[9] invention.

[10] In fact, the Harris Corp. case that we
[11] talked about a moment ago, that the plaintiff
[12] cited in their brief applies that very principle.

[13] And there are many, many other cases that
[14] support this holding.

[15] Like I said, we cited a couple of those in
[16] our brief.

[17] So these details of the fine alignment
[18] process, as an example cannot be read out of the
[19] algorithm.

[20] You can't just simply say fine alignment
[21] alone is the algorithm.

[22] Because the specification says that the
[23] details are an important part of the invention.

[24] I would next like to discuss portal image.

[25] So now I am moving away from the algorithm

[1] And that is not reflected in the
[2] plaintiff's interpretation of portal image.

[3] And these are key elements.

[4] And it is reflected in the portion of
[5] Varian's proposed construction, that says that it
[6] is the treatment beam that is generating this
[7] portal image.

[8] I would next like to talk about an element
[9] in claim 26 of the '431 patent regarding which
[10] there is also a dispute of interpretation.

[11] Claim 26, as you will recall, is not the
[12] tracking claim.

[13] It is a broader matching claim.

[14] It says -- broader in one sense.

[15] Broader in that you don't have successive
[16] images.

[17] But narrower in the sense it explicitly
[18] calls out that when you are doing matching, you
[19] do it without input of any physical dimensions of
[20] any features in the images.

[21] So there is a question about what this
[22] means.

[23] And what we pointed out in our brief is
[24] that during the prosecution history of this
[25] claim, there was a point in time at which the

Page 210

Page 212

[1] issue.

[2] You heard testimony from both Dr. Balter
[3] and Dr. Schell about what a portal image is.

[4] And Dr. Balter explained that it is an
[5] image created with a megavolt treatment beam.

[6] And also that the resulting image is two
[7] dimensional.

[8] And I am not going to go through detail
[9] about our argument on this.

[10] A lot of it was presented during the direct
[11] testimony.

[12] And again, in our brief.

[13] But I did want to point out a couple
[14] things.

[15] One is that the University of Pittsburgh's
[16] proposal for the interpretation of this term
[17] ignores its own expert's explanation of what a
[18] portal image is.

[19] You heard Dr. Schell testify both on direct
[20] and on cross examination, that a portal image
[21] must mimic the treatment beam.

[22] He didn't agree that you have to mimic it
[23] in terms of the energy of the beam. But he did
[24] admit that it must include the beam shape and the
[25] beam angle.

[1] patent office had said we are going to allow this
[2] patent to issue.

[3] But before the patent actually issued, the
[4] attorney for the applicants came forward and
[5] said, "We found a new prior art reference that we
[6] think anticipates one of the claims in our
[7] patent."

[8] That reference was by an author called
[9] McParland.

[10] And the attorney said claim 1 of our patent
[11] we think is not patentable over this reference.

[12] So we are going to amend that reference.

[13] And in the process of doing that, they also
[14] presented argument about why certain of their
[15] other claims did not need to be amended.

[16] And were patentable over McParland.

[17] Now, when they got to claim 26, something
[18] interesting happened.

[19] They referred to this phrase about not
[20] inputting physical dimensions.

[21] But they changed the wording of it in a
[22] significant way.

[23] They did not say without input of any
[24] physical dimensions of any features in the
[25] images.

Page 213

Page 215

[1] They said without input of any physical dimensions or any features in the images.
[2] Which broadens the statement in a material way.
[3] It is saying we can do matching without inputting physical dimensions.
[4] And now in addition to that, we can do matching without input of any teacher in these images.
[5] Now, the plaintiff has said that was just a typographical error. No harm done.
[6] But that is wrong for two reasons.
[7] First of all, it is not a subjective test, when you are determining what the prosecution means and how it relates to the interpretation of a claim.
[8] If a person of ordinary skill in the art would read the statement and think that it was being done intentionally and materially, then it has an impact regardless of what the prosecutor's intent was.
[9] But more importantly, the indication is that this was not a typographical error at all.
[10] Because the placement of "or" instead of "of" was material and necessary to the

[11] When they were explaining, as I said about claim 26 to the examiner, the only basis why they said that claim 26 was patentable over McParland was that claim 26 required this additional step of without input of physical dimensions of any features. I am sorry, or any features.
[12] So now that we focus on that particular element, let's look both at what the examiner said about McParland and about what McParland says about itself.
[13] In characterizing McParland to the examiner, the applicant said McParland specifically requires the user identify anatomical match points in the two images to even begin to perform an alignment.
[14] And looking at a statement from McParland that talks about the same process. It says images are displayed on a monochrome monitor and registration match points are selected using a cursor and mouse interface.
[15] So what is happening here is not that the user is inputting dimensions of any features in the image.
[16] Rather, the user is simply marking features in the image.

Page 214

Page 216

[1] applicant's argument about why McParland did not render claim 26 unpatentable.
[2] To understand this, let's first take a look at the original claim 1, that the applicants did say was not patentable over McParland.
[3] Claim 1 included the following elements.
[4] A means digitizing a portal image and a simulation image.
[5] Which is essentially the same digitizing means that is in claim 26.
[6] And it had a processing means, processing the digital image signals to generate match signals, which is essentially the same processing means as in claim 26, merely without the additional statement about without input of physical dimensions of features.
[7] And then finally there was an output means, which is essentially the same thing as the display means in claim 26.
[8] So a claim that was the same as claim 26, except for the statement about without input was admitted by the applicants to be not patentable over McParland.
[9] This is borne out by their discussion of claim 26.

[10] So if you were to say, "Oh, but in the claim 26, we require input of physical dimensions," well, that wouldn't help you distinguish McParland, because it didn't require physical dimensions either.
[11] They had to go broader than that.
[12] And argue that their patent didn't require physical dimensions or any features to be input.
[13] And that was the only way that they were able to get around McParland.
[14] And there is another statement in the prosecution history, which reflects this, where they said the claimed apparatus does not require identification of any information in the images. Such as the anatomical match points required by McParland.
[15] Now, that statement wasn't made specifically in regard to claim 26.
[16] It was related to a different claim in the patent.
[17] But the characterization of McParland is the same.
[18] It doesn't rely upon which claim is being discussed.
[19] So unless you have any questions, I have no

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 217

Page 219

[1] further discussion on those points. And I will
[2] turn the discussion over to Mr. Anthony.

MR. ANTHONY: What is the order of terms?

MR. POPPE: You will be discussing the
digitizing means and the '431 patent.

MR. ANTHONY: Thank you.

So your Honor, in the '431 patent, and of
course the '431 patent is the image matching
patent matching two x-ray images, a poor and a
good one.

And the claim term is digitizing means.

And it says for digitizing successive
portal images to generate successive sets of
digital portal images signals.

So the function is there.

And it is in the claim.

The issue is: Is there structure?

As Mr. Poppe has said, that whenever means
is used, there is an assumption it is a means
plus function claim, as authorized in 35 USC 112,
paragraph 6.

And so here the use of the means creates
the assumption that this is a means plus function
claim.

And we have to consider not only the

[1] tells you what each of those two digitizers are.
[2] And Dr. Schell certainly agreed with that in his
[3] testimony today.

And this is the default proof credit card
system.

Had a very similar limitation. It says
means for dispensing at least one debit card for
each transaction.

And so a bare bones statement similar to
the statement in the '431 patent followed by a
statement in the specification that said the
dispenser 40 is loaded with three or more stacks
of debit cards.

Now, here the federal circuit at 412 fed
third, 1291, 2005, held that the patent failed to
identify adequate structure corresponding to the
means for dispensing.

And found that therefore dispenser was not
supported by structure.

What is important about this, your Honor,
is the purpose of 112-6. And efforts of this
nature to defeat the purpose of 112-6. Supreme
court says if you have a broad, all encompassing
claim, you can't have a claim that any way you
digitize an image.

Page 218

Page 220

[1] function but the structure that accomplishes that
[2] function.

[3] And so figure 1 is the sole drawing or
[4] image that shows the digitizer.

[5] And that is element No. 29.

[6] It is a box.

[7] It is a box labeled digitizer.

[8] It does not embody any circuitry, hardware,
[9] optics or anything for digitizing.

[10] It just says it is a digitizer.

[11] And as the witness has testified, that the
[12] word digitizer appears in the specification in
[13] one spot only.

[14] And that is column 4, lines 53 through 59.

[15] And it has somewhat of a circular
[16] definition.

[17] **A digitizer is something that digitizes.**

[18] That of course really conveys no structure.

[19] The witnesses are in agreement, there is a
[20] wide variety of digitizers.

[21] And you heard Dr. Schell say that well, it
[22] is not just one digitizer, because you need more
[23] than one digitizer here.

[24] And there is no information either in that
[25] sole box in figure 1 or here in column 4 that

[1] Just like you can't have a claim to any way
[2] you dispense a card, because that is unduly
[3] broad.

[4] You will thwart innovation by taking up all
[5] that territory with your claim.

[6] So when the 52 act was passed, they said
[7] "Okay, we are going to take care of that problem"
[8] by requiring the applicant, the patentee to
[9] specify particular structure that represents that
[10] means.

[11] Then we will limit him to that structure
[12] and equivalence thereof.

[13] Now, how do you defeat that?

[14] Don't put any structure in your patent.

[15] You defeated the purpose of 112-6 in curing
[16] the Supreme Court's objection to broad means
[17] claims.

[18] This is a back door way of undoing 35 USC
[19] 112-6, simply don't put any structure in. Now
[20] you have no gauge for equivalence. And in the
[21] infringement case, you will hear them argue,
[22] everything is equivalent. You heard some of that
[23] today.

[24] That is contrary to the very purpose of
[25] 112-6 you must have structure.

Page 221

Page 223

[1] Now, here -- let's go to the next slide.
[2] Here there is actually something different
[3] than the federal circuit case. In fact, highly
[4] unusual.
[5] There is a reason why there is no structure
[6] for the digitizer in the '431 patent, and that
[7] reason is selfishness.
[8] What happens, and we have the testimony of
[9] Mr. Athanassiou, and we have his transcript
[10] here. Mr. Athanassiou was the designer of this
[11] system.
[12] And he had a special connection with the
[13] company that was building the digital camera,
[14] which embodied the digitizer.
[15] And he found out a way to vastly improve
[16] that digitizer.
[17] Vastly improve the digitizer on the
[18] marketplace.
[19] So what did they do?
[20] They decided instead of disclosing the
[21] structure in the patent, to withhold it as a
[22] trade secret, make it proprietary to U Pitt and
[23] CMU.
[24] And indeed, when I got to that point, I
[25] said "Mr. Athanassiou, what is the digitizer

[1] another image and compare those two, and you
[2] tracked movement.
[3] Well, sometimes common sense needs to come
[4] in to play.
[5] Tracking here is all about a very dangerous
[6] radiation beam that kills cells.
[7] Yes, it kills tumor cells, cancer cells,
[8] but also kills healthy cells.
[9] And we want to track in order to limit as
[10] Dr. Greenberger said, limit the damage to healthy
[11] cells.
[12] How do we track with images, which are
[13] taken at vastly different times?
[14] And so tracking requires rapid taking of
[15] images in order to determine movement.
[16] And then doing something about it.
[17] This was the point that the witness said
[18] that tracking has two components.
[19] One is determining that movement has
[20] occurred.
[21] That is the tracking.
[22] And secondly, doing something.
[23] Tracking is not losing sight of something.
[24] It is following it.
[25] So something in the equipment must follow

Page 222

Page 224

[1] structure you actually use?"
[2] He said, "I will not tell you that. That
[3] is confidential."
[4] We had to go on a confidential record
[5] before he would reveal what changes he made to
[6] the commercial digitizer to vastly improve it for
[7] the purposes of this patent, and particularly to
[8] have it operate at the speed that was necessary
[9] for this tracking function.
[10] And so here there is a selfish reason why
[11] the structure is not there.
[12] Not only a selfish reason, but of course we
[13] defeat 112-6 by having no structure to point to,
[14] so that we can't do an equivalence consideration
[15] in determining infringement.
[16] So here we would like holding from this
[17] court that there is no structure disclosed.
[18] Matt.
[19] **MR. POPPE:** Now talk about tracking and
[20] successive.
[21] **MR. ANTHONY:** Tracking.
[22] There was some suggestion from Dr. Schell,
[23] that can you track by taking an image on one day
[24] during one treatment and perhaps a day later,
[25] perhaps hours later, perhaps days later you take

[1] it.
[2] So in our suggested construction, we say
[3] the function of tracking is automatically
[4] adjusting radiotherapy diagnostic equipment such
[5] as switching the radiation beam on or off or
[6] repositioning the patient couch.
[7] Now, our supports for that includes
[8] intrinsic evidence.
[9] Go to the next slide.
[10] You can see that a column 9, lines 14
[11] through 16 is that express statement.
[12] As tracking continues, successive portal
[13] images are matched with the next proceeding
[14] portal image, not well spaced apart in time or
[15] images, to generate the updated transform.
[16] And if we go even to the language of the
[17] claim.
[18] Look to the preamble of claim 21.
[19] It is an apparatus for matching portal
[20] images to control radiotherapy diagnosis
[21] equipment.
[22] So both the idea of measuring movement and
[23] doing something with that measurement is in the
[24] claim itself.
[25] Figure 11 illustrates a tracking routine.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

	Page 225		Page 227
[1]	I won't go through that now.	[1]	principles I discussed earlier apply here in the same way they apply to the '431 patent.
[2]	Because I think it was well handled by our witnesses.	[2]	You again have the statement from default proof credit card that the corresponding structure must include all structure that performs the recited function.
[3]	And U Pitt of course argues the file history.	[3]	You have the Itron case, corresponding structure consists of the particular flow charts disclosed in the patent.
[4]	And it is a circular argument.	[4]	And you have Dr. Jiang's testimony regarding what those flow charts are as disclosed in the specification of the '554 patent.
[5]	Patentee stated the tracking called for in claim 21 is effected by the movement detected in successive images generated by the single portal imager.	[5]	It is therefore our position those flow charts and the related text and the specification constitute the corresponding structure for this means term.
[6]	Effected.	[6]	If you will go to the next slide.
[7]	And that of course means caused.	[7]	Just as in the '431 patent, the '554 patent also includes statements about how portions of this algorithm constitute the invention. Not simply an embodiment.
[8]	It is causation concept.	[8]	So for example, there is a statement that the invention satisfies certain requirements stated immediately beforehand by utilization of successive levels of filtering and templates,
[9]	Something is effected by being changed.	[9]	
[10]	And that is our construction, as you can see that, cause, paren brought about by the movement detected in successive images.	[10]	
[11]	And so the language that is cited by U Pitt actually supports our view that there needs to be not only a detection of the motion.	[11]	
[12]	But you have to change the equipment in response to that detection of motion.	[12]	
[13]	And U Pitt argues that the matching does not require the determination of movement of features between images. But can be used for	[13]	
[14]		[14]	
[15]		[15]	
[16]		[16]	
[17]		[17]	
[18]		[18]	
[19]		[19]	
[20]		[20]	
[21]		[21]	
[22]		[22]	
[23]		[23]	
[24]		[24]	
[25]		[25]	
[1]	other purposes.	[1]	which are modified to accommodate for actual conditions.
[2]	That is an incorrect argument.	[2]	So this incorporates that idea that was discussed at length about first template matching as an element of the algorithm.
[3]	And mere matching of images only gives you the information of movement.	[3]	And also the ability to adjust for varying lighting conditions.
[4]	And it does not take it the rest of the way to cause actual tracking.	[4]	For example, by changing the template to account for those varying lighting conditions.
[5]	And there is multiple purposes for tracking.	[5]	And then secondly, you have a statement that an important aspect of the invention is the fine tuning of the tracking templates called for at 120 in figure 6.
[6]	And of course in the patent, two purposes that are explained is turning the beam on and off and moving the treatment couch.	[6]	Figure 10 illustrates the details of fine tuning the templates.
[7]	Thank you.	[7]	So this is saying that the fine tuning of the templates to account for varying lighting conditions is not just part of the invention.
[8]	MR. POPPE: Your Honor, we will shift to the '554 patent now.	[8]	It is an important aspect in the invention.
[9]	Unless you want to handle it differently.	[9]	And yet, it is an aspect the plaintiff would like to read entirely out of the claim construction of this case.
[10]	JUDGE ZIEGLER: That is fine, sir.	[10]	And that is not appropriate under the principles we discussed.
[11]	MR. POPPE: I will discuss the first element, which is another one of the algorithmic elements.	[11]	Now I will turn argument to Zheng Liu to
[12]	Specifically, the means determining movement of said patient from claim 20 of the '554 patent.	[12]	
[13]	Again, our expert, Dr. Jiang covered this in detail.	[13]	
[14]	This slide simply illustrates how the	[14]	

Page 229

Page 231

[1] discuss camera means and gating means.
 [2] **MS. LIU:** Your Honor, in '554 patent, the
 [3] expert has already testified regarding what a
 [4] camera means mean.

[5] So I won't go in to too many details except
 [6] a few of the issues that is raised by plaintiff.

[7] So first is there is a presumption that a
 [8] term with means in the language is a means plus
 [9] function term.

[10] It is the plaintiff's burden to overcome
 [11] this assumption.

[12] And the case law also clearly requires
 [13] there has to be sufficient structure, not just
 [14] some structure.

[15] University of Pittsburgh has been arguing
 [16] that there is some structure, for example the
 [17] name camera.

[18] Camera is a camera.

[19] However, there are many different types of
 [20] cameras available with vastly different level of
 [21] capabilities.

[22] Like our expert Dr. Jiang has testified.

[23] In the majority of the cameras in 1996 are
 [24] not even digital cameras and they cannot generate
 [25] digital image signals.

[1] The patented invention requires a camera
 [2] that is sensitive at different lighting
 [3] conditions.

[4] And it processes images at high speed. So
 [5] they can track the movement of the fiducial
 [6] during breathing.

[7] And it has to operate at high resolution.

[8] And that requires special cameras.

[9] And the patent did not disclose the
 [10] structure of special cameras.

[11] Except mentioning of a CCD.

[12] In University of Pittsburgh's reply brief
 [13] for claim construction, it raised an argument
 [14] that Varian's proposed construction using the
 [15] phrase one or more cameras contradicts with
 [16] Varian's own legal argument.

[17] But it does not.

[18] So first, the word camera is too generic to
 [19] constitute a sufficiently definite structure.

[20] And when the specification does not
 [21] disclose the structures for camera means, Varian
 [22] cannot add to that.

[23] Varian can only identify what is disclosed
 [24] in the specification.

[25] But cannot add to its proposed construction

University Of Pittsburgh v.
Varian Medical Systems, INC.,

<p style="text-align: right;">Page 233</p> <p>[1] any unusual structure. [2] And the patent never mentioned the word [3] "infrared" or any other light spectrum. It just [4] generally refers to light. [5] And when most of the cameras are visible [6] light cameras, when the specific algorithm or [7] design to deal with this situation, the camera [8] has to be limited to visible light cameras. [9] Again, the special algorithms were designed [10] to monitor the fiducials under varying lighting [11] conditions as Dr. Jiang testified. [12] The varying lighting conditions is common [13] in the treatment room, because people -- the [14] different level of the lights available. [15] I won't go in to all these details for the [16] citations. [17] Basically, there is plenty of evidence in [18] the specification showing that the algorithms [19] were specially designed to meet -- to overcome [20] this problem. [21] And it is an important part of the [22] invention. [23] In University of Pittsburgh's reply brief, [24] it also -- let me go back. [25] Plaintiff initially argued that the patent</p>	<p style="text-align: right;">Page 235</p> <p>[1] the camera means claim 20 to Gerig exactly. [2] It is just saying it is obvious. [3] In addition, the examiner never stated that [4] camera means includes infrared cameras. [5] Actually, the word "infrared" did not even [6] appear in that office action. [7] More interestingly, in the response to this [8] office action, this particular office action is [9] Exhibit 7 of plaintiff's opening brief. [10] And this office action rejected more than [11] claim 20 and many other claims. [12] And the patentee differentiated from the [13] Gerig patent on the basis that Gerig uses [14] infrared light, infrared cameras. [15] And it is basically saying we don't use [16] that. [17] Of course, that is claim 1. [18] Not claim 19. And later which becomes [19] claim 20. [20] However, claim 1 is a claim that is very [21] similar to claim 20, currently. [22] Also the specification has only described [23] the one camera. [24] Not different. [25] The specification only describes one</p>
<p style="text-align: right;">Page 234</p> <p>[1] examiner equated the camera means of claim 20 [2] with infrared camera in the cited prior art [3] reference. [4] It is a Gerig patent. [5] And Varian countered that the examiner did [6] not characterize Gerig's camera as infrared [7] camera. [8] It only just mentioned it. [9] And then in the reply brief, plaintiff has [10] a new approach. [11] However, this does not really change the [12] prosecution history. [13] The examiner applied the camera means in [14] Gerig for the purpose of 103, obvious rejection. [15] Not section 102, anticipation rejection. [16] We all know 102, anticipation, you are [17] basically saying something in the prior art and [18] something you are trying to claim, they have an [19] element by element match. [20] But for 103, there is no such indication. [21] The examiner basically was saying that, oh, [22] there is a Gerig reference. [23] And Gerig reference in light of another [24] reference make the claim obvious. [25] And that does not mean that examiner equate</p>	<p style="text-align: right;">Page 236</p> <p>[1] camera, one type of camera. [2] And if the claim 1 was able to survive, by [3] distinguishing on the basis that Gerig uses [4] infrared light and they do not, there is a strong [5] indication that infrared light is not included [6] for claim 20. [7] Another phrase still in dispute is gating [8] means generating gating signals synchronized with [9] said movement associated with breathing by said [10] patient. [11] And the parties disagree on the [12] corresponding structure. [13] Varian believes that because the [14] specification very specifically described the [15] first specific tolerance range. [16] The second specific tolerance range. [17] And that should be included as part of the [18] structure. [19] And the plaintiff disagrees. [20] The two tier tolerance structure is a key [21] part of the invention. [22] You can see that in many different quotes [23] throughout the patent. [24] They are in summary of the invention. [25] In the brief description of the preferred</p>

[1] embodiment.

[2] It is everywhere it talks about using the
[3] alarms.

[4] Having the two tier structure.

[5] And this first paragraph, long paragraph,
[6] Dr. Jiang also identified.

[7] Specifically talks about display includes a
[8] traffic light 67 heavy in green section. Then
[9] there is yellow section, red section.

[10] And also there are other descriptions in
[11] other parts of the patent.

[12] In University of Pittsburgh's reply brief,
[13] it had a new argument saying that Varian's
[14] construction contradicts with Varian's
[15] own publication about the meaning of gating
[16] signals.

[17] But this argument is not relevant.

[18] A Varian publication from 2005 is not
[19] proper extrinsic evidence for claim construction
[20] purposes.

[21] It has incorrect timing, thus is not
[22] relevant to what a person of ordinary skill in
[23] the art would have thought at the time of the
[24] patent application.

[25] And also the claim construction has nothing

[1] really need to be emphasized.

[2] **JUDGE ZIEGLER:** You may do so.

[3] **MR. JOHNSON:** So let's talk about this
[4] camera means in the '554.

[5] We assert that it is not a claim that needs
[6] to be construed because it is clearly
[7] understood.

[8] Varian says they define it as generating
[9] digital image signals representative of an image
[10] of the patient.

[11] That is found nowhere in the patent.

[12] And we have already shown you numerous
[13] references where they only talk about a camera.
[14] So what did we get in response, since we know
[15] this is a means plus function or at least they
[16] say it is.

[17] Then they say it is too generic to be
[18] structured.

[19] Well, the fact of the matter is, if a claim
[20] element contains the word "means" and recites a
[21] function, it is presumed, however, if the claim
[22] recites sufficient structure to perform the claim
[23] function, it is not means plus function.

[24] You had me cross examine their witnesses.
[25] They testified of course there were cameras out

[1] to do with how defendant may refer to a term
[2] under different circumstances, but what the
[3] patentee intended the term to mean in the patent
[4] at the time of the application.

[5] So we believe this University of
[6] Pittsburgh, this argument, is not relevant.

[7] Thank you, your Honor.

[8] **JUDGE ZIEGLER:** Anything further?

[9] **MR. POPPE:** Yes.

[10] Mr. Anthony will address two more terms
[11] related to the '554 patent.

[12] One is the claim 20, digital image signals
[13] representative of an image of the patient. Then
[14] in claim 21, the term fiducial on said patient.

[15] **JUDGE ZIEGLER:** Counselor, according to my
[16] calculation, you have completed the time
[17] allotted.

[18] I will give you an extra ten minutes.

[19] **MR. POPPE:** We will reserve that time, your
[20] Honor.

[21] **JUDGE ZIEGLER:** The court reporter needs a
[22] break.

[23] We will take a five minute recess.

[24] (Recess taken.)

[25] **MR. JOHNSON:** There are some points that

[1] there that could do this.

[2] I got in to a quibbling match over whether
[3] or not there was one appropriate lens or
[4] another. But that to the one of ordinary skill
[5] in the art, which is the standard, not what we
[6] heard today.

[7] The standard is what would this mean to
[8] somebody of ordinary skill in the art?

[9] They all testified that yes, they
[10] understood what it was.

[11] And yes, there were cameras available that
[12] would accommodate this particular result.

[13] So to tell you that there were cameras that
[14] wouldn't doesn't answer your question.

[15] We provided you with evidence, which
[16] demonstrates that the camera in this circumstance
[17] is what it is.

[18] I would also like to comment on those
[19] slides about the statement that in 1996 there
[20] were no digital cameras, and they couldn't do
[21] this.

[22] There was no evidence of that put in this
[23] record.

[24] Nor could they, because it is simply not
[25] the case.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 241

Page 243

[1] So I will skip through this.
 [2] But I want to go to Dayco.
 [3] That is about adding limitations to claims
 [4] not required by the claim terms themselves is
 [5] impermissible.
 [6] What we have seen and heard today is an
 [7] attempt to add claim terms.
 [8] Now, you just heard that Gerig somehow was
 [9] distinguished on the grounds we distinguished
 [10] Gerig on the grounds it was infrared camera.
 [11] You can look at the language. We will give
 [12] it to you.
 [13] That is not true.
 [14] At no point did we assert that the fact
 [15] that Gerig is an infrared camera in and of itself
 [16] meant that that was a distinguishing
 [17] characteristic.
 [18] Gerig was distinguished on other grounds.
 [19] Specifically, speed and other ways in which
 [20] it operated.
 [21] Our response was Gerig as mentioned can
 [22] only determine patient position at a repetition
 [23] rate of five seconds.
 [24] Obviously, too slow to detect breathing.
 [25] Furthermore, there is nothing in Gerig to suggest

[1] Now, here is our construction of these
 [2] digital image signals representative of an image
 [3] of said patient.
 [4] We literally use the plain meaning.
 [5] We only substitute the word "likeness" for
 [6] "image".
 [7] Although it doesn't matter.
 [8] What does Varian do?
 [9] It says digital images, signals that
 [10] collectively represent a single two dimensional
 [11] image of the body of the person undergoing
 [12] radiation therapy.
 [13] That is not claim construction.
 [14] That is claim rewriting.
 [15] They are simply adding language that
 [16] doesn't exist in any of the claims to try to get
 [17] as narrow a reading as possible.
 [18] Because we are going to be able to
 [19] demonstrate at trial they infringe.
 [20] Now, the next point has to do with the
 [21] fiducials.
 [22] We say the digital image signals may
 [23] include fiducial markers on the patient.
 [24] And the court heard about the fiducials.
 [25] You are aware that these fiducials are used in

Page 242

Page 244

[1] how the rhythmic movement associated with
 [2] breathing could be extracted from a camera image.
 [3] That is at 9 and 10, Bates stamp 127444.
 [4] So the assertion that we attempted to
 [5] distinguish Gerig on the ground we didn't have
 [6] infrared is wrong.
 [7] Now, I will skip to the rest -- the next
 [8] point they had was this question about digitizer.
 [9] And what we did, we cite you to a case
 [10] where the word "detector" was used.
 [11] In this case, personalized media
 [12] communications.
 [13] Here is -- the following was stated. "The
 [14] fact that a detector was defined in terms of its
 [15] function does not detract from the definitiveness
 [16] of structure."
 [17] "Even though the term detector does not
 [18] specifically evoke a particular structure, it
 [19] does convey to one knowledgeable in the art a
 [20] variety of structures known as detectors."
 [21] If you substitute the word "digitizer" for
 [22] "detector", that is the -- it would convey to one
 [23] of knowledgeable skill in the art, that you would
 [24] use a digitizer.
 [25] Because it was well known and understood.

[1] the operation of this particular device.
 [2] But the specification says as shown in
 [3] figure 5, the display 53 presents an image of the
 [4] patient 37 with the fiducials appearing
 [5] prominently.
 [6] Clearly, they are being used as part of the
 [7] invention.
 [8] What happens as far as we are concerned is
 [9] you can use either natural or artificial
 [10] fiducials.
 [11] How do we know that? It says so right in
 [12] the specification.
 [13] I didn't hear anything about that
 [14] primarily, because their witness gave it away on
 [15] cross examination.
 [16] But one of the problems they were making
 [17] was that only natural fiducials could be used,
 [18] not artificial.
 [19] I assume it was abandoned since it wasn't
 [20] argued today.
 [21] But I want to emphasize that point, because
 [22] it is consistent with other things we heard
 [23] today.
 [24] And finally, all of the discussion about
 [25] what the invention was, you notice there was no

	Page 245	
<p>[1] tying it directly to the claim.</p> <p>[2] Because they are dependent claims that</p> <p>[3] cover specific implementations.</p> <p>[4] Claim 21, for example, an image of at least</p> <p>[5] one fiducial.</p> <p>[6] And that indicates that there can be other</p> <p>[7] scenarios, where there could be more than one</p> <p>[8] fiducial.</p> <p>[9] Different types of fiducials.</p> <p>[10] But the point is that it is not proper to</p> <p>[11] try to rewrite a claim by asserting it can only</p> <p>[12] mean a certain thing.</p> <p>[13] And that is exactly what they have done</p> <p>[14] here.</p> <p>[15] Now, this means determining movement, we</p> <p>[16] say determining movement of the patient directly</p> <p>[17] or indirectly from the digital image signals.</p> <p>[18] And we added for completeness, including</p> <p>[19] movement associated with breathing by the</p> <p>[20] patient.</p> <p>[21] Because that is what the claim says.</p> <p>[22] And all that is required is a processor</p> <p>[23] programmed to implement a patient motion detector</p> <p>[24] and equivalents.</p> <p>[25] What does Varian say? Determining movement</p>	<p>[1] identifies and tracks movement.</p> <p>[2] Tracking movement is not ambiguous.</p> <p>[3] It is plain.</p> <p>[4] And therefore, in order for them to import</p> <p>[5] language or to use prior art, they had to prove</p> <p>[6] to you that there was ambiguity about this</p> <p>[7] language.</p> <p>[8] They didn't do that.</p> <p>[9] What they really did was make an argument</p> <p>[10] about invalidity.</p> <p>[11] And this is not the time or the place for</p> <p>[12] invalidity arguments.</p> <p>[13] I will be more than happy to address those</p> <p>[14] arguments and the fact that the prior art they</p> <p>[15] claim is prior is not at another point in time.</p> <p>[16] For your purposes, as we pointed out today,</p> <p>[17] the question is you don't look at prior art</p> <p>[18] unless there is an ambiguity.</p> <p>[19] And you don't address validity, as I</p> <p>[20] pointed out earlier this morning, unless there is</p> <p>[21] the ambiguity, which causes you to need to use</p> <p>[22] this effectively little used operation of</p> <p>[23] evaluating validity, reading of claim to avoid</p> <p>[24] validity.</p> <p>[25] The reason they had to do it was they have</p>	
	Page 246	
<p>[1] of the patient from the digital image signals of</p> <p>[2] the patient's body including movement associated</p> <p>[3] with breathing by the patient, which is fine.</p> <p>[4] But then they say it is a computer</p> <p>[5] processor programmed to perform the specific</p> <p>[6] software routines set forth in attachment 1</p> <p>[7] hereto.</p> <p>[8] In other words, you heard the argument.</p> <p>[9] Again, that that means that everything in the</p> <p>[10] algorithm has to be part of the claim.</p> <p>[11] Well, they then go on to argue that these</p> <p>[12] digital image signals, the artificial fiducials</p> <p>[13] are required to be of the patient's body or on</p> <p>[14] the patient's body, which means that you can't</p> <p>[15] have an artificial fiducial.</p> <p>[16] Now, let's look at the intrinsic evidence.</p> <p>[17] That is the evidence in the patent and</p> <p>[18] specification on means determining movement.</p> <p>[19] You can see listed here numerous instances</p> <p>[20] where the patient motion detector 47 detects and</p> <p>[21] identifies the fiducials and then tracks their</p> <p>[22] movement.</p> <p>[23] Go down to the bottom.</p> <p>[24] The invention is directed to apparatus</p> <p>[25] responsive to movement of a patient which</p>	<p>[1] difficulty with the plain language.</p> <p>[2] Now, you heard about WMS Gaming.</p> <p>[3] I was interested in that analysis. In</p> <p>[4] large part because the way he argues it, it would</p> <p>[5] appear that oh, that meant that everything was</p> <p>[6] included.</p> <p>[7] But if you look at that structure, where</p> <p>[8] they had the particular means.</p> <p>[9] And they described it.</p> <p>[10] It didn't say you had to have each of the</p> <p>[11] elements internally.</p> <p>[12] He admitted that with his reel.</p> <p>[13] What did it have to do? It had to perform</p> <p>[14] the operation.</p> <p>[15] That is what is patented.</p> <p>[16] The operation of doing the reeling.</p> <p>[17] And he glossed over that, because if you</p> <p>[18] perform the operation, and you can do it, let's</p> <p>[19] say you have a reel that has a red housing or a</p> <p>[20] reel with no housing, and a reel with green</p> <p>[21] housing, still a reel.</p> <p>[22] It performs the operation of reeling.</p> <p>[23] Now, here is our patient motion detector</p> <p>[24] algorithm.</p> <p>[25] You heard the testimony about Varian limits</p>	

University Of Pittsburgh v.
Varian Medical Systems, INC.,

	Page 249	Page 251
[1]	this to requiring at least 30 steps.	[1] claim term.
[2]	Then it says Odetics doesn't say anything different.	[2] Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.
[3]	And they try to distinguish Harris versus Ericsson.	[3]
[4]	But if you notice the distinction of Harris -- of the Harris case, they didn't point out the fact that the court stated that a microprocessor programmed to carry out a two-step algorithm in which the processor calculates generally nondiscrete estimates and then selects a discrete value closest to each estimate is the construed claim.	[4]
[5]	It is true you have to look at the rest of the algorithm for purposes of seeing if there is structure there.	[5] We put that in because we have numerous dependent claims that cover very specific aspects of the invention.
[6]	But the construction, which is what we are doing here today, is exactly as we show it.	[6] And they ignore that, because they want to say oh, you have to have this aspect of the invention. Well, it is claimed in a dependent claim. That is all we have to do. No more was required.
[7]	And therein lies the rub.	[7] This gating means. We just talked about it.
[8]	Because if it is described as a two step algorithm that performs these estimates, if you have a two-step algorithm that performs the estimates to arrive at the result, you are going to infringe.	[8] Our definition is on the left.
[9]	And there is a reason, your Honor,	[9] Generate gating signals synchronized with the movement and the structure is the computer programmed to implement a gating signal generator.
[10]		[10] What is a gating signal?
[11]		[11] It turns the beam on and off. It actuates the beam.
[12]		[12] That is what it does.
[13]		[13] You can turn the beam on and off on a variety of circumstances.
	Page 250	Page 252
[1]	logically.	[1] But look what Varian did.
[2]	It is because if you look at any of those flow charts and even the ones in our patent, they have correcting techniques.	[2] Varian said you had to be a computer processor programmed to perform the following specific software routines.
[3]	Like if this happens and this is false, then you go over here.	[3] The fiducials move outside first specified tolerance range.
[4]	But if it does happen and you skip all the way to the bottom, those correcting techniques while they are useful for purposes of making sure that the operation works, not required.	[4] Then you have to display alarm warnings.
[5]	If you could do it perfectly every time, you could skip and you wouldn't need any of those correcting techniques.	[5] Then the fiducials have to move outside a second specified tolerance range, generate and transmit signals to the connected equipment to turn the radiation beams off.
[6]	But that is what is contained in the algorithm, because that is the way you would write a particular flow chart.	[6] Then if they move back within, you can turn it on again.
[7]	It doesn't matter if you check it step A or step C.	[7] Guess what?
[8]	What matters, you accurately get the result, which is to track a fiducial or to track the movement.	[8] That is nowhere in the patent.
[9]	If you look at the Phillips decision, where it says other claims of the patent in question, both asserted and unasserted can be valuable sources of enlightenment as to the meaning of a	[9] In fact, that combines two different claims.
[10]		[10] One covering alarm warnings.
[11]		[11] The other covering the gating signal.
[12]		[12] There is no excuse other than by adding as much detail as you can, you can try to avoid infringement.
[13]		[13] The intrinsic evidence, we cited it in the patent.
[14]		[14] But it is very clear, your gating signal

Page 253

Page 255

[1] generator has to send a signal to the beam
[2] generator and says activate, turn on or off.
[3] And no more is required.
[4] And you can see that in the detail. We
[5] will give you a book. I won't bother to read all
[6] this now. It is all there.
[7] It is very clear that that is what it is
[8] doing. Anyone of ordinary skill in the art
[9] understands that.
[10] Here is more evidence of what it is.
[11] But I was amused by counsel's assertion
[12] that using a Varian publication for gating means
[13] is irrelevant.
[14] Especially since their publication says
[15] gating enables a radiation beam to selectively
[16] treat a moving target by electronically turning
[17] the beam on and off at specified intervals.
[18] Well, our people would tell you they were
[19] saying the same thing back in the early '90s.
[20] So this particular document in 2005 is
[21] nothing more than reflect what was known and is
[22] known.
[23] And that definition is the one we are
[24] using.
[25] And it is commonly understood by those of

[1] I only want to say the following.
[2] First we heard that if it was an artificial
[3] fiducial, it wasn't part of the claim. That was
[4] in the brief.
[5] Now it has to be attached to the body.
[6] That is not in the claim.
[7] And I was confused by what it meant to be
[8] on the body, because since I wear glasses as does
[9] your Honor, when I have my glasses on and a
[10] picture is taken, is that an image of me? I
[11] think so.
[12] If I take my glasses off, and the picture
[13] is taken, that is still an image of me.
[14] So having my glasses on or having fiducials
[15] on or off, nothing whatsoever to do with whether
[16] or not it remains an image of me.
[17] The patent clearly discloses the use of
[18] fiducials with the patient's anatomical
[19] structure.
[20] And they operate as a marker.
[21] That is all they do.
[22] And there is no reason to go with their
[23] definition which is a feature or object detected
[24] by the means determining movement and used as a
[25] reference point.

Page 254

Page 256

[1] ordinary skill.
[2] I will skip through the alarm warning. I
[3] think we have gone through that.
[4] Now let's go over to processing.
[5] Computer processor that implements a
[6] patient motion detector and a gating signal
[7] generator and equivalents.
[8] Again, they now have processor -- their
[9] definition requires a computer processor (i.e., a
[10] chip). Whatever that is.
[11] Programmed to perform the software routines
[12] associated with the means determining movement of
[13] the patient and the gating means.
[14] Doesn't make any sense.
[15] A computer processor by definition is a
[16] collection of silicon chips. To add a
[17] parenthetical would only confuse things further.
[18] Our definition is clear and it is very
[19] straight forward.
[20] Now we come to the digital image signals
[21] processed by a processor, which is computer 49.
[22] Again, this issue with the chip.
[23] I will skip right past that.
[24] Now let's go to claim 21.
[25] Fiducial.

[1] It is a marker.
[2] There was no ambiguity.
[3] Not one of their witnesses testified it was
[4] ambiguous in any way.
[5] In fact, in their argument they certainly
[6] advocated that it was not ambiguous.
[7] And again, this is a list of all of the
[8] fiducial -- all of the evidence referencing
[9] fiducial.
[10] You will notice that the bottom, it is
[11] called the same thing in the dictionary, in the
[12] stereotactic radiotherapy dictionary.
[13] And it is referred to that in various
[14] patents.
[15] So I don't think there is any doubt but
[16] what one of ordinary skill in the art would call
[17] this a marker.
[18] We have gone through this on said patient.
[19] It could be on the patient in a lot of different
[20] ways.
[21] And not without having to be taped directly
[22] to the -- attached directly to the patient's
[23] body.
[24] There is nothing in the patent that
[25] required that.

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 257

Page 259

[1] They then go on to say it has to be done
[2] without a rigid spatial relationship to other
[3] fiducials.

[4] Nothing in the patent says that.

[5] They want it, because it will help them
[6] with a noninfringement argument, I suppose.

[7] But that is not what we are here today to
[8] do.

[9] We are here to construe these claims as a
[10] matter of law.

[11] We are limited to what the claims say.

[12] And what the specification will support.

[13] These are areas they didn't address. Means
[14] determining movement of at least one fiducial and
[15] means generating said gating signals synchronized
[16] to actuate said beam generator synchronism with
[17] patient breathing.

[18] We request you adopt our analysis and the
[19] way we construed those particular claims.

[20] Now let's go to the '431.

[21] Again, I will move quickly.

[22] This means digitizing successive portal
[23] images to generate successive sets of digital
[24] portal image signals.

[25] As you can see on the left, we don't think

[1] And that case had to do with a column that
[2] was located near a particular area on a chip.

[3] And the only reason I know that is I
[4] litigated that case.

[5] The fact of the matter is, that satisfies a
[6] particular area requirement.

[7] And given the fact that everyone who
[8] testified here today understood what the
[9] structure is, there is no basis for arguing that
[10] digitizer should somehow not be construed by this
[11] court to be exactly what it is.

[12] And here you will see what I just told you,
[13] that you don't have to include subject matter
[14] that is known in the field of the invention and
[15] is in the prior art for patents are written for
[16] persons experienced in the field of the
[17] invention.

[18] Again, here is the situation involving the
[19] detector. I will not repeat the argument.

[20] It has equal application here.

[21] Again, we have also cited numerous
[22] references where they talk about this digitizing
[23] means, which generate a digitized image.

[24] And just to be clear, all we are talking
[25] about is using a device that converts an analog

Page 258

Page 260

[1] there is any reason to come up with any novel
[2] definition.

[3] We identify digitizer of an electronic
[4] portal imager or digitizer for x-ray film and
[5] equivalents as appropriate structure.

[6] They say there is no structure identified
[7] in the patent.

[8] Well, the problem with that argument is
[9] their experts as well as ours all said digitizers
[10] are well known.

[11] The argument was well, maybe there might be
[12] a digitizer or two that would not be useful.

[13] Well, that is why these folks are of
[14] ordinary skill.

[15] And the patent law is very clear.

[16] You do not have to provide for structures,
[17] which are commonly known, any more detail than to
[18] put people on notice as to what they need.

[19] And here is the case of Atmel versus
[20] Information Storage Devices.

[21] All one needs to do is recite some
[22] structure corresponding to the means in the
[23] specification as the statute states, so that one
[24] can readily ascertain what the claim means and
[25] comply with the particulate requirement.

[1] signal to a digital signal.

[2] You have a cell phone with a camera on it,
[3] you have a device that will do exactly that.

[4] Now we come to the word "successive".

[5] I didn't hear much about successive today.

[6] We take the normal dictionary definition,
[7] following in order.

[8] They say taken in an uninterrupted sequence
[9] during a single radiation treatment.

[10] There is nothing in the patent that says
[11] that successive has to be taken in an
[12] uninterrupted sequence during a single radiation
[13] treatment.

[14] You heard the testimony of our expert, who
[15] said that you needed to have a reference frame
[16] and in successive pictures, so that you would be
[17] able to compare one of it with another.

[18] But it wasn't limited by time.

[19] Nor was it limited by one particular
[20] treatment.

[21] Again, we gave the ordinary meaning to
[22] successive as following in order.

[23] We think it is right.

[24] And we disagree that adding the additional
[25] limitations that Varian has requested is proper

Page 261

Page 263

[1] or permitted under the law.

[2] Now let's go to portal image.

[3] We said a portal image is an x-ray image
[4] taken by the treatment setup during the radiation
[5] treatment phase as opposed to the simulation
[6] phase.

[7] We read that to you in the patent earlier
[8] today.

[9] And we said a portal image may or may not
[10] be taken with x-rays of MV energy.

[11] Now, what does Varian say?

[12] They call it two dimensional image created
[13] by projecting a high energy megavolt x-ray
[14] treatment beam through the extreme portal and
[15] then through a patient at a particular point in
[16] time during radiotherapy treatment.

[17] That is not in the claim.

[18] The claim says a portal image is used.

[19] It talks about the types of portal images
[20] there are.

[21] And how they are accomplished.

[22] And if they have a noninfringement argument
[23] based on a portal image, they ought to make it at
[24] that time.

[25] They can't try to rig the process by

[1] There is nothing that says it has to be a
[2] specific range.

[3] Only other point I want to emphasize. If
[4] there was something particular about the power or
[5] the energy setting, it would have been claimed.

[6] And then the extraneous material added.

[7] It has to be a two dimensional image.

[8] Why?

[9] It is not required by the claim.

[10] It has to have high energy megavolt x-ray
[11] treatment beam.

[12] Not required by the claim.

[13] And it has to go through the treatment
[14] portal.

[15] And in through a patient at a particular
[16] point in time during radiotherapy treatment.

[17] It doesn't.

[18] Portal image is defined in a way that makes
[19] it clear.

[20] They are adding limitations. And that is
[21] all they are doing.

[22] Now we have the tracking means movement
[23] between successive sets of DPIS.

[24] I have already gone through this.

[25] The argument isn't going to change.

Page 262

Page 264

[1] defining a term, which is explicitly stated set
[2] forth in the patent, in a way that would make it
[3] impossible for anybody to come within it.

[4] Again, in our brief, we cite you to the
[5] intrinsic evidence which talks about the need for
[6] portal image.

[7] And that defining them as x-ray images made
[8] by the radiation beam after it has passed through
[9] the patient.

[10] And the point I want to emphasize here,
[11] your Honor, is by not having a specific energy
[12] requirement for the x-ray, it makes the most
[13] sense, because let's say it was 280 whatever.

[14] And you came in at 200.

[15] You say no, that is not a portal image,
[16] because it is only 200 and not 280.

[17] In our view of the world, that is not how
[18] you read the claim.

[19] If you are calling something a portal
[20] image, whatever voltage or dosage -- energy level
[21] you are using, it is still a portal image.

[22] Our definition of port film is a radiograph
[23] x-ray taken on the radiation treatment machine.

[24] No intrinsic and expensic evidence
[25] required.

[1] Again, in our brief, we have gone through
[2] this and showed you exactly where it is.

[3] We have gone through the algorithm
[4] argument, your Honor, for the tracking means. I
[5] will not repeat it.

[6] Except I want to emphasize two things.

[7] You heard this argument about robust as
[8] being somehow critical to the patent. And
[9] somehow that made a difference in terms of how
[10] the claims should be interpreted.

[11] And then you also heard the argument about
[12] well, different resolutions, and those are
[13] critical.

[14] Well, dependent claims 22 through 24 relate
[15] directly to this robust motion flow.

[16] So they are claimed separately.

[17] And as we pointed out under the law, that
[18] is all that is required.

[19] And this calculating repetitively different
[20] resolutions, that is dependent claim 25.

[21] If they had wanted to limit their claims in
[22] other ways, they could have done so.

[23] Because they demonstrated looking at just
[24] these claims, that they knew how to do.

[25] Now, tracking movement, the only thing I

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 265

Page 267

[1] want to point out here, take a look at their
[2] construction and ours.
[3] We say determining movement by changes in
[4] the content of the digital portal image signals.
[5] What do they say?
[6] Automatically adjusting radiotherapy
[7] diagnosis equipment such as switching the
[8] radiation beam on or off or repositioning the
[9] patient couch, in response to patient movement.
[10] That is about as narrow and limiting as you
[11] can possibly be. They have effectively rewritten
[12] the claim in a way that presumably makes them
[13] happy. But clearly is not proper claim
[14] construction.
[15] And again, we showed you the intrinsic
[16] evidence.
[17] The requiring the tracking movement to
[18] automatically adjust radiotherapy diagnosis
[19] equipment is simply not part of the claim.
[20] It also would mean that every time we
[21] track, we have to adjust the equipment.
[22] There is no reason for that to be true.
[23] It is clearly not required by the patent.
[24] Now we come to matching portal images.
[25] We briefed this.

[1] I think our definition is totally proper.
[2] And consistent with the patent claims.
[3] Now we come to reference image.
[4] The same thing.
[5] We defined it before.
[6] I am not going to repeat it here.
[7] But again, you can see the difference
[8] between our definition -- our construction and
[9] theirs is we use the plain meaning.
[10] They keep adding meanings.
[11] Here again, this is the intrinsic evidence
[12] that supports our view of reference image.
[13] And just the first one, reference images
[14] could be another x-ray image or another type of
[15] image.
[16] It doesn't -- a requirement it be a
[17] megavoltage and done at a certain time and
[18] certain way is simply not part of the claim and
[19] not supported by anything in the specification.
[20] Now, the processing means again, same
[21] arguments we made before.
[22] Along with the issue of the corresponding
[23] structure.
[24] We have already addressed that.
[25] This is rather interesting.

Page 266

Page 268

[1] Essentially, our argument is it is part of
[2] the preamble of claim 21.
[3] And therefore is not a limitation.
[4] Varian argues statistical now part of the
[5] limitation, you have to read in this additional
[6] work.
[7] The problem is the law says that preamble
[8] claims are not limiting.
[9] The only time you look to them is if they,
[10] quote, "Breathe life in to the claim".
[11] And they didn't make any argument today
[12] because I don't think there was any to be made,
[13] about breathing life in to the meaning of the
[14] claim.
[15] Because all the claim requires is tracking
[16] movement between successive digital portal
[17] images.
[18] It doesn't require any of the rest.
[19] We have gone through x-ray image.
[20] But you see our definition.
[21] An image represented on an x-ray film or
[22] captured by an x-ray image detector.
[23] You see theirs, two dimensional, on and on
[24] and on.
[25] We have gone through that.

[1] So let's -- this is the "of or" argument.
[2] They said because you said "or", when you were
[3] prosecuting your patent, that that somehow meant
[4] that you changed, except they neglected to tell
[5] you what the language in claim 26 is.
[6] Claim 26 reads on the left, processing said
[7] first and second digital signals without input of
[8] any physical dimensions of any features within
[9] said images to generate matched digital image
[10] signals.
[11] The only way they would be in a position to
[12] argue that that was something different, was if
[13] they could demonstrate that we had disclaimed
[14] some portion of the invention.
[15] What he did, he found a word, he said oh,
[16] you said "or," not "of".
[17] That couldn't be a typo. Because there
[18] were other things going on.
[19] So it therefore follows that that really
[20] should be an "or".
[21] If that were true, the patent office would
[22] have insisted that the word be changed.
[23] It wasn't.
[24] That is the claim.
[25] And that is the claim they may not be happy

	Page 269	Page 271
[1]	with. But it is the claim that governs the issues in this case. And the issue, the disclaimer, we briefed it. But if they wanted to argue that it was a disclaimer, you would have to show explicit evidence, not argument, not speculation. And that is all you heard today. Now, the processing means and the algorithm, we have identified coarse and the fine alignment. If you remember, I specifically asked their expert: Would somebody of ordinary skill understand coarse alignment? The answer was yes. Would they understand fine alignment? Yes. Would they understand how to use algorithms to accomplish the result? Yes. Guess what? That is what is required for purpose of providing disclosure to one of ordinary skill in the art.	[1] algorithm broadly, concluding a description of the steps necessary to carry out the claimed function was sufficient to constitute structure. And then in the case in Minnesota, the court need not construe the individual components of the structures supporting the function of the means plus function element. Instead, the court need only construe the overall structure which corresponds to those claimed functions. And then here is the Phillips case. Which we talked about in our opening. I just want to emphasize one more time. That your job is construe these claims. And that in this case, unlike in Klein and other cases in which doctrine of construing claims to preserve their validity has been invoked, the claims terms at issue is not ambiguous. It is not ambiguous. You don't use this doctrine of trying to preserve validity. And since nobody argued these claims were ambiguous, there is no basis for making a prior art argument they made here today, unless it is a
[1]	Not only that, but if you look at the specification, you will see, for example, where it says the processing means includes coarse alignment means, which first affect the coarse alignment between the digital portal image signals and the digital simulation image signals. And then following a coarse alignment a fine alignment is performed. The fact of the matter is patent goes on to say if the coarse alignment is satisfactory, you don't need to do a fine alignment. And here is that very point being made, column 6, 57 through 60. You know under the argument advanced by the experts for Varian the fine alignment would have been required, because it was part of the algorithm. I will not make the same argument we already made about Odetics and Harris, your Honor. I will say that there were other district court cases, which we cited, which they didn't cite, which bear directly on this point. Network Appliance, the court observed in applying this rule, WMS Gaming appeared to define	[1] dry run for the trial. And I thank them for that. Without input of any physical dimensions, we say it means what it says. They say using no information about the contents of the images other than information derived by the apparatus directly from the images themselves. It is simply an overstatement of what is required. And we recite all of the intrinsic evidence that supports our position. And again, you see the argument about the one of ordinary skill. I am not going to go through the display means, your Honor. It is pretty self evident it is a display is a display. Nothing more is required. And then we have the generating, again we use the term generating to mean bring into being. They say actively processing a nondigital image to create. It is not in the patent. Not part of the claims, not part of the
[2]		

<p>[1] specification.</p> <p>[2] Again, simply trying to come up with a definition, so they can have a noninfringement argument, that is not the purpose of claim construction.</p> <p>[3] So I will stop here.</p> <p>[4] Because I think we covered all of those terms that needed covered.</p> <p>[5] I wanted to thank you for your time and patience.</p> <p>[6] We will be providing you with a set of our slides, so you will have them to review later, if you wish.</p> <p>[7] Thank you, very much.</p> <p>[8] JUDGE ZIEGLER: Thank you, Mr. Johnson.</p> <p>[9] Mr. Anthony.</p> <p>[10] Mr. Poppe.</p> <p>[11] Ten minutes, sir.</p> <p>[12] MR. POPPE: Thank you, your Honor.</p> <p>[13] First, I want to talk about my favorite topic of the algorithms and the means plus function claims.</p> <p>[14] Mr. Johnson during his argument made a couple statements which I think illustrated exactly why their analysis is incorrect.</p>	<p>[1] Page 273</p> <p>[2] they are trying to interpret the various algorithm claims in the different patents.</p> <p>[3] In our case, with every single claim means plus function term that includes a -- that corresponds to an algorithm, we have consistently said you need to take every single step in the algorithm discussed in the flow charts and the text of the patent that relates to that term.</p> <p>[4] In the plaintiffs' different claim constructions, they have taken various degrees of levels of specificity with respect to each term.</p> <p>[5] For example, in the '554 patent, when they are talking about a means detecting movement, they simply say, "Oh, this is just a patient motion detector."</p> <p>[6] Very clean and simple. Of course, that could cover just about anything.</p> <p>[7] But you contrast that with the way that their proposed interpretation of the terms in the '431 patent, if you look, for example, at the processing means in claim 26, they don't simply say oh, this is a image matching -- or image matcher which would be consistent with the way they adopted -- they have taken for the patient motion detector in the '554 patent.</p>
<p>[1] He said that in connection with the means plus function term, it is the operation that is patented.</p> <p>[2] And he said it is only the results that count.</p> <p>[3] And that is exactly what the United States Supreme Court said a means plus function claim cannot be interpreted to cover, or it is invalid back in 1946.</p> <p>[4] And that is why Congress stepped in and said, "No, we are going to insist that a means plus function claim be interpreted to incorporate the corresponding structure in the patent so it is not just the function."</p> <p>[5] It is not just the operation that is going to be covered.</p> <p>[6] It is going to be a specific way of implementing that function.</p> <p>[7] It is going to be a specific way of reaching that result that will be the subject of the patent.</p> <p>[8] So this I think illustrates the fundamental disagreement that we have about the proper way of interpreting an algorithm claim.</p> <p>[9] There is also an inconsistency in the way</p>	<p>[1] Page 274</p> <p>[2] Instead, presumably because they think it benefits them in some sort of infringement or invalidity manner, they have added a few arbitrary additional terms from the specific algorithmic components described in the specification.</p> <p>[3] And then they incorporated a different set of specifics, when they are talking about the tracking mechanism.</p> <p>[4] For example, there is an interesting question about why they think that the steps of coarse and fine alignment are things that should be considered part of the corresponding structure for one of the claims but not the other where they only talk about fiducials.</p> <p>[5] There is an inconsistency there, which is reflective of the fact they are simply going after something beneficial to them in this case and not doing a rigorous application of the appropriate legal principles that apply to this type of claim term.</p> <p>[6] In connection with a couple -- another sort of general theme that Mr. Johnson was enunciating is that Varian supposedly is trying to incorporate language from the specification in to</p>

[1] the claim language that isn't reflected in any of
[2] the claim terms that are actually there.
[3] That is not the case.
[4] Let's take for example the portal image
[5] term.
[6] If we go to a jury in this case and try to
[7] explain to them what a portal image is, to
[8] Dr. Balter he knows what a portal image is, but
[9] they will not know.
[10] So we need to tell them what it is. That
[11] requires identifying certain characteristics of
[12] what a portal image is.
[13] Those characteristics according to
[14] Dr. Balter including it is a megavolt image.
[15] It captures the shape of the treatment
[16] beam, et cetera.
[17] That is not importing new terms in to the
[18] claim.
[19] It is simply explaining what the existing
[20] term is.
[21] That is what a portal image is.
[22] So it doesn't make sense to say I don't
[23] care if it is a portal image, that is a kilovolt
[24] image.
[25] It is all a portal image.

[1] Well, it is not according to Dr. Balter.
[2] Only certain types of images are portal
[3] images. Otherwise, a person of ordinary skill in
[4] the art would not understand it to be a portal
[5] image.
[6] And that is the approach we have taken in a
[7] number of other terms.
[8] We are trying to explain what existing
[9] terms in the claims are.
[10] And in order to do that, sure, you have to
[11] use other language.
[12] But that is not the same thing as simply
[13] plugging something in, because you want it to be
[14] there in the claim, when it is not there at all.
[15] We are interpreting the words that are
[16] already in the claim.
[17] There is one point that was made in
[18] connection with the Odetics case.
[19] Mr. Johnson referred to several district
[20] court cases that have interpreted the Odetics
[21] case.
[22] And there are a couple of district court
[23] cases from different districts in the country
[24] that seem to have interpreted Odetics in the way
[25] that Mr. Johnson has.

[1] the claim in which it appears.
[2] The term "successive" appears in a claim
[3] that is talking about tracking.
[4] And as Dr. Battler explained, tracking had
[5] an understood meaning in the art at the time of
[6] the patent, which means you are tracking motion
[7] in real-time.
[8] You are not taking a point of position on
[9] one day and a point of position on another day
[10] and comparing them.
[11] You are actually seeing what ongoing motion
[12] is, so you control the equipment.
[13] And it is that context in which you have to
[14] consider the word "successive".
[15] And it, therefore, doesn't mean just any
[16] two images taken at different points in time.
[17] They are taken in a short period of time.
[18] So the tracking function that is the
[19] subject matter of claim 21 of the '431 patent can
[20] actually occur.
[21] And one other point I want to mention is
[22] the "of" versus "or" argument in connection
[23] with -- you are familiar with what I am talking
[24] about.
[25] Here it is not just a matter of

University Of Pittsburgh v.
Varian Medical Systems, INC.,

Page 281		Page 283
[1] interpreting the claim. [2] But there is an estoppel occurred because [3] of the argument that the patentee made to the [4] Patent and Trademark Office in order to overcome [5] a specific piece of prior art. [6] So this isn't just a case where you are [7] looking at the patent claim to see what it means. [8] They are estopped as a matter of law from [9] arguing that it is broader than what they argued [10] to the claim construction -- or to the patent [11] office. [12] So there is a different principle involved [13] here that the plaintiff has ignored. [14] And as a final point, I want to address the [15] argument that the tracking and perhaps the [16] matching process in the '431 patent can include [17] the coarse alignment step without a fine [18] alignment step following it. [19] Mr. Johnson suggested that oh, well, the [20] patent says that after coarse alignment occurs [21] and the matching process, then it gives the user [22] an option of either accepting the coarse [23] alignment or then going forward with the fine [24] alignment. [25] Their claim construction based on that	[1] Have a safe trip home. [2] --- [3] (Thereupon, at 3:30 o'clock p.m. the [4] hearing was concluded.) [5] --- [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25]	
		Page 284
[1] discussion has suggested you might have an [2] infringing apparatus that doesn't have any fine [3] alignment option whatsoever. [4] That is not what the patent says. [5] The patented algorithm always at least [6] gives the user the option of going forward with [7] fine alignment. [8] The algorithm that is present always has a [9] fine alignment capability in it. [10] It is just that in some circumstances, it [11] may give the user an option with going forward. [12] Another it may just do it automatically. [13] There is no suggestion in the patent that [14] you could cover an algorithm that only has coarse [15] alignment with no fine alignment option or [16] functionality following it. [17] Thank you very much for your time, your [18] Honor. [19] JUDGE ZIEGLER: Thank you, counselors. [20] We will take this matter under advisement. [21] I would like to say your briefs were well [22] prepared. [23] And this argument was ably presented. [24] I think the clients have been very capably [25] represented in this case.	[1] REPORTER'S CERTIFICATE I, Lance E. Hannaford, certify that the foregoing two hundred eighty-three (283) pages are a true and correct transcript of my stenographic notes taken at the proceedings on Thursday, November 29, 2007, at the offices of 32nd Floor, One Oxford Centre, Pittsburgh, Pennsylvania 15219. ----- Lance E. Hannaford Reporter [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25]	

EXHIBIT G

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

UNIVERSITY OF PITTSBURGH,)
)
Plaintiff,)
)
v.) Civil Action No. 2:07-CV-00491
)
)
VARIAN MEDICAL SYSTEMS, INC.,) Hon. Arthur J. Schwab
)
Defendant.)

REPORT AND RECOMMENDATION OF SPECIAL MASTER

Pending before the Special Master in this patent infringement action is the motion of defendant, Varian Medical Systems, Inc., (Varian), for summary judgment for lack of standing, or in the alternative, a motion for a preliminary hearing on the issue.

I. INTRODUCTION AND PROCEDURAL HISTORY

This patent infringement action involves the two patents-in-suit, e.g., U.S. Patent Nos. 5,727,554 (the 554 patent), and 5,784,431 (the 431 patent). Plaintiff, the University of Pittsburgh, (UPitt), filed a complaint on April 13, 2007, and Varian filed an answer and counterclaim on May 14, 2007. On June 4, 2007, the District Court entered a case management order requiring that, among other things, fact discovery shall be completed on or before October 5, 2007. Following the entry of that order, the parties engaged in intensive fact and expert discovery, as well as motion practice on various discovery-related issues. In addition, the parties submitted *Markman* briefs and a Joint Disputed Claim Terms Chart. A *Markman* hearing was held on November 29, 2007, wherein the parties presented evidence and argument pertaining to their positions.

Varian filed the instant motion for summary judgment on November 21, 2007, and Judge Arthur Schwab referred the motion to the Special Master. On December 5, 2007, UPitt filed a brief in opposition to the motion for judgment, along with a motion to join Carnegie Mellon University as a plaintiff, pursuant to Federal Rule of Civil Procedure 19. Varian filed papers in opposition to the motion and, on December 14, 2007, Judge Schwab denied UPitt's motion to join Carnegie Mellon University as a party. (Docket No. 168). Varian then filed a reply memorandum in support its motion for judgment for lack of standing, and we turn now to the contentions of the parties.

Since this civil action was filed, the parties have devoted substantial time and resources to this case. The docket contains over 250 entries. Varian seeks summary judgment with respect to UPitt's complaint with prejudice due to lack of standing because the alleged co-owner of the patents-in-suit, Carnegie Mellon University, (CMU), is an absent but critical party to this litigation. Varian claims that UPitt, if it wishes to pursue a claim for infringement, must file the claim along with its co-owner, CMU. UPitt rejoins that CMU has assigned all substantial rights to any enforcement action by UPitt, and therefore Varian's motion must be denied. After considering the submissions of the parties, we recommend that the District Court grant Varian's motion without prejudice to the University of Pittsburgh filing an amended complaint, in which CMU is added as a party plaintiff. In the alternative, we recommend that the District Court vacate its order dated December 14, 2007, denying UPitt's motion to join, and then deny the instant motion as moot.

II. FACTS

Both patents-in-suit name the same five inventors, Joel Greenberger, Andre Kalend, Takeo Kanade, Karun Shimoga, and Charalambos Athanassiu. They were ultimately developed through a joint collaboration (Joint Project) between UPitt and CMU. (Concise Statement, ¶ 3;

Responsive Statement, ¶ 3). Two of the inventors, Drs. Kanade and Shimoga, were employees of CMU during the relevant period of the Joint Project. The remaining two inventors, Drs. Greenberger and Kalend, were employed by UPitt during the relevant period. (Concise Statement, ¶ 9; Responsive Statement, ¶ 9).

On or about October 13, 1994, UPitt and CMU jointly adopted “Policy Guidelines – Intellectual Property Rights and Technology Transfer Procedures in Collaborative Projects of the University of Pittsburgh and Carnegie Mellon University,” (1994 UPitt/CMU Joint IP Policy), which remained in effect until June 30, 1997. Subsequently, on June 18, 1997, UPitt and CMU jointly adopted “Policy Guidelines – Intellectual Property Rights and Technology Transfer Procedures in Collaborative Projects of the University of Pittsburgh and Carnegie Mellon University” (1997 UPitt/CMU Joint IP Policy), which remained in effect until June 30, 2000. The 1994 and 1997 UPitt/CMU Joint IP Policies (Joint IP Guidelines), which appear to be identical in all material respects, were continuously in effect during all relevant periods, namely, during the performance of the Joint Project, at the time of the filing of the patents-in-suit, and at the time of the issuance of the patents. (Concise Statement, ¶ 20; Responsive Statement, ¶ 20).

UPitt admits that the Joint IP Guidelines, together with an assignment, executed in 1996 by the inventors to UPitt, govern ownership of the patents-in-suit. (Responsive Statement, ¶¶ 20-22). One of the stated objectives of the Joint IP Guidelines was to “facilitate the subsequent commercialization of IP rights.” (Motion, Exs. P and Q, Part A.3). The Joint IP Guidelines provide, in relevant part, as follows: “All IP developed jointly by CMU Participants and Pitt Participants during collaboration *shall be owned jointly* by Pitt and CMU and shall be administered in accordance with these Guidelines.” (Concise Statement, ¶¶ 15, 18). The Joint IP Guidelines provide that the participants will determine the contributions by the participants to

determine allocation of expenses and proceeds between UPitt and CMU. (Motion, Exs. P and Q, Part E).

The Joint IP Guidelines also provide that:

[t]he “University Allocation” of expenses and proceeds will be proportionate to the sum of the Relative Contributions by the individual Participants from the two universities.

For example, if two Pitt Participants made at [sic] total of 60% and three CMU Participants 40% of the Relative Contribution toward the invention, then 60% of total distributions will go to Pitt and 40% to CMU, for each university’s respective further allocation of proceeds.

Id. (emphasis in original). Furthermore, “[i]n order to clarify and record all details of the resulting allocation of proceeds, a specific Allocation Agreement will be developed the Allocation Agreement will define the percentage of Net Proceeds to be received by each of the two universities” *Id.* The Joint IP Guidelines further provide that UPitt and CMU “will share the Net Proceeds from the commercialization” of joint inventions “in proportion to” the Universities’ Allocation Agreement. (Motion, Exs. P and Q, Part G). There is evidence that the parties discussed the allocation with respect to the patents at 60% CMU and 40% UPitt, although there is no evidence that these discussions were recorded or memorialized, as contemplated by the Joint IP Policies.

The Joint IP Policies also provide for the designation of one of the two universities’ technology transfer offices, as the “Responsible TT Office,” which office would facilitate commercialization of IP rights (in this case, the patents-in-suit). Relevant here, the Joint IP Policies provide:

2. The Designated TT Office will have the sole responsibility for the commercialization of the IP disclosures resulting from the [collaborative project]. The normal policies and practices used by the Designated TT Office will apply, including the decision process of whether or not the university wishes –

- (a) to pursue the commercialization of a particular Disclosure, and in what manner, or
- (b) to turn it back to the inventors.

The Designated TT Office will, however, include at least one faculty member of the other university in completing the evaluation process of each Disclosure.

The TT Office which emerges with the responsibility for the commercialization of a Disclosure will be called the “Responsible TT Office.”

3. The Responsible TT Office will work closely with the Participants in planning and executing commercialization of that Disclosure. It will keep the Participants and the other TT Office well informed on its activities and plans, will be sensitive and responsive to any special circumstances (for examples [sic], special regulatory requirements) of the other university, and will consult with the other TT Office on such issues.

Id. at Part F. The parties agree that UPitt was designated as the institution responsible for commercializing the patents.

The parties’ course of conduct also confirms that UPitt was the lead institution in commercializing the patents. However, the evidence also establishes that UPitt understood CMU’s approval was required, as co-owner, to negotiate exclusive licenses and options. For example, when UPitt was negotiating a license with Varian in 2002, UPitt sought approval from CMU as to the licensing terms to be offered. In addition, on or about October 29, 1998, UPitt, CMU, and Elekta Oncology Systems, Inc., entered an agreement in which Pitt and CMU *jointly* granted Elekta an option to negotiate a royalty-bearing, exclusive license to the patents-in-suit.

In 1996, the inventors “assigned” their rights in the patents-in-suit to UPitt pursuant to a boilerplate “Assignment.” Likewise, the patents-in-suit-identify UPitt as the “Assignee.” (Motions, Exs. B and C, at p. 1). The assignment makes no mention of CMU or the Joint IP Guideline. There is testimony from UPitt’s designee, Laura Hillock, that the purpose of the

assignment was to facilitate the patent process: “The inventions derived from a collaborative relationship, ownership was with—assignment was to the University of Pittsburgh, which is common to do that up-front for the ease of filing and other things in collaborative relationships.” (Motion, Ex. R, p. 47). The parties dispute the legal import of the assignment, with UPitt contending that it had “substantial rights” in the patents-in-suit, and Varian rejoining that it is irrelevant to CMU’s joint ownership of the patents.

III. SUMMARY JUDGMENT STANDARD

Summary judgment is appropriate “if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(c); *see also Israel Bio-Engineering Project v. Amgen, Inc.*, 475 F.3d 1256, 1263 (Fed. Cir. 2007). In deciding whether summary judgment is appropriate, the court must view the evidence in the light most favorable to the non-moving party, with doubts resolved in favor of the non-movant, in this case UPitt. *Israel Bio-Engineering*, 475 F.3d at 1263. Issues of standing may be resolved by way of summary judgment and, where there is no dispute as to the material facts, judgment is appropriate on the issue of standing. *See, e.g., id.*

IV. LEGAL ANALYSIS

A. Standing to Sue

The Patent Act of 1952 (“Act”) provides that “[a] patentee shall have remedy by civil action for infringement of his patent.” 35 U.S.C. § 281. In addition, the Act provides that:

patents shall have the attributes of personal property

[P]atents, or any interest therein, shall be assignable in law by an instrument in writing. The . . . patentee . . . may in like manner grant and convey an exclusive right under his . . . patents, to the whole or any unspecified part of the United States.

A certificate of acknowledgement under the hand and official seal of a person authorized to administer oaths within the United States . . . shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent[.]

35 U.S.C. § 261. Thus, under the Act, a “patentee” includes not only the patentee to whom the patent was issued but also the successors in title to the patentee.” 35 U.S.C. § 100(d). *See also Israel Bio-Engineering*, 475 F.3d at 1264.

It is a well-settled that a co-owner of a patent must voluntarily join in any action or the case will be dismissed for lack of standing. *See, e.g., Israel Bio-Engineering*, 475 F.3d at 1264 (“[a]bsent the voluntary joinder of all co-owners of a patent, a co-owner acting alone will lack standing.”),(citing *Prima Tek II, L.L.C. v. A-Roo Co.*, 222 F.3d 1372, 1377 (Fed. Cir. 2000)); *see also* 8 Donald S. Chisum, *Chisum on Patents* § 21.03[3][d] (LexisNexis 2005)(“The traditional rule is that all of the co-owners of a patent must join in bringing a suit for infringement.”),(citing cases at n.66). The purpose of the rule is to protect the interests of a defendant in avoiding multiple lawsuits concerning alleged infringement of the same patent. *See, e.g., Willingham v. Lawton*, 555 F.2d 1340, 1344 (6th Cir. 1977). As the Court of Appeals noted,

Defendants in an infringement suit initiated by a single joint owner could have a justifiable fear that should they prevail and the court determine that the patent in suit is either invalid or not infringed, the remaining joint owners might still relitigate these issues at a later date in another costly and vexatious proceeding. Even though the remaining joint owners might be bound under traditional rules of collateral estoppel or res judicata, and despite the fact that such a repetitive suit may be an appropriate case for the awarding of attorney fees to defendants[,] defendants still could be prejudiced.

Id. at 1345 (footnote 7 omitted). Thus, if CMU is a co-owner of the patents-in-suit, CMU must appear as a party in this infringement action.

UPitt argues that, although CMU is a co-owner of the patent, CMU transferred all substantial rights to UPitt pursuant to the Joint IP Guidelines, and therefore UPitt has the right to

bring this action without CMU as a party, citing *Ortho Pharm. Corp. v. Genetics Inst. Inc.*, 52 F.3d 1026, 1030 (Fed. Cir. 1995); *Prima Tek II, LLC v. A-Roo Co.*, 222 F.3d 1372, 1378 (Fed. Cir. 2000); and *Vaupel Textilmaschinen KG v. Meccanica Euro Italia S.P.A.*, 944 F.2d 870, 875 (Fed. Cir. 1991)). In other words, UPitt as a co-owner and UPitt as the “transferee” of the co-owner, in these two capacities, has standing to sue. We disagree. The record establishes that CMU did not transfer all substantial rights in the patents to UPitt to satisfy the test of standing, and Varian's motion for summary judgment must be granted.

B. Transfer of Substantial Rights

There is an exception to the standing rule requiring the owner of a patent to be joined in the action. “The exception is that, where the patentee makes an assignment of all substantial rights under the patent, the assignee may be deemed the effective ‘patentee’ under 35 U.S.C. § 281 and thus may have standing to maintain an infringement suit in its own name.” *Prima Tek*, 222 F.3d at 1377 (citing *Vaupel*, 944 F.2d at 875; *Ortho Pharm.*, 52 F.3d at 1030). “To determine whether a[n] . . . agreement has conveyed all substantial rights in a patent, and is thus tantamount to an assignment, we must ascertain the intention of the parties and examine the substance of what was granted.” *Id.* at 1378 (citing *Vaupel*, 944 F.2d at 874-75). “In so doing, it is helpful to look at what rights were retained by the grantor.” *Id.* Courts “pay particular attention to whether the agreement conveys *in full* the right to exclude others from making, using, and selling the patented invention in the exclusive territory.” *Id.* at 1379.

Pursuant to the Joint IP Guidelines, UPitt was designated as the party with the responsibility of commercializing the patents, which is consistent with the stated objective of the Joint IP Guidelines “to facilitate the subsequent commercialization of IP rights.” However, the Joint IP Guidelines are devoid of any assignment of CMU’s *rights* in the patents. This is a distinction with a difference. A contractual responsibility is a duty which a party assumes

pursuant to the contract, which is generally not assignable, whereas a contractual *right* is an interest or benefit which is generally assignable. *See, e.g., Saxe v. Feinstein*, 77 A.2d 419, 421 (Pa. 1951); *Ptashkin ex rel. Fliegelman v. Department of Public Welfare*, 731 A.2d 238, 245 n.9 (Pa. Commw. Ct. 1999). Here, the Joint IP Guidelines, as well as other evidence of record, establishes that UPitt assumed a responsibility, but the evidence does not establish that Carnegie Mellon University assigned or transferred all of its substantial rights to the patents.

“In the absence of a special agreement, each of the co-owners of a patent may make, use or sell the patented invention . . . without the consent of and without accounting to the other owners.” 35 U.S.C. § 262; *see also Schering Corp. v. Roussel-UCLAF SA*, 104 F.3d 341, 344 (Fed. Cir. 1997)(“[e]ach co-owner’s ownership rights carry with them the right to license others, a right that also does not require the consent of any other co-owner.”); *Willingham*, 555 F.2d at 1344. Indeed, “unless the co-owner has given up these rights through an ‘agreement to the contrary,’ 35 U.S.C. § 262, the co-owner may not be prohibited from exploiting its rights in the patent[.]” *Schering*, 104 F.3d at 344. Although the Joint IP Guidelines contemplated that the proceeds would be shared with UPitt, there is no evidence that, pursuant to the Joint IP Guidelines or otherwise, CMU gave up its rights to license the patents.

The record establishes that CMU retained the right to license the patents, and that UPitt did not receive an assignment of the right to exclude others from making, using, and selling the patented invention. *Cf. Prima Tek*, 222 F.3d at 1379-80 (Prima Tek did not obtain substantial rights in the patents because it “had no right to exclude others from practicing the patents”); *Schering*, 104 F.3d at 344-47 (co-owner did not relinquish right to license pursuant to an agreement with its co-owner). In addition, there is no evidence in the Joint IP Guidelines, or elsewhere, that CMU relinquished its right to sue for infringement, or the right to use the

patented inventions, both of which are substantial rights. *See, e.g., Abbott Labs. v. Diamedix Corp.*, 47 F.3d 1128, 1132-33 (Fed. Cir. 1995)(licensee lacked standing where patent owner retained limited right to make, use, and sell products); *Vaupel*, 944 F.2d at 875 (transfer of a right to sue for infringement was “particularly dispositive” of whether plaintiff had substantial rights in the patent so as to confer standing).

Although the *inventors* entered into an assignment with UPitt, CMU was not a party to the assignment, and for this reason, CMU’s rights were unaffected. In any event, there is evidence that the assignment was done for ease of filing. While the assignment may be indicative that UPitt was the institution responsible for commercializing the patent, the assignment is not evidence that CMU transferred all of its substantial rights to UPitt.

In sum, we find that CMU is a co-owner of the patents and retained substantial rights in the patents-in-suit. CMU is a necessary party to this action. We recommend that the District Court grant the motion for summary judgment without prejudice.

C. Additional Recommendations for Proceeding

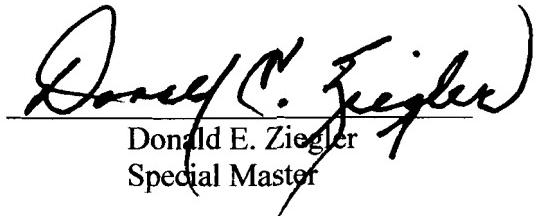
Although we recommend that the motion for summary judgment be granted, we recommend that it be granted without prejudice to UPitt to file an amended complaint, within thirty days, in which CMU is added as a party plaintiff, which would correct the standing deficiency. The interests of justice and judicial economy weigh in favor of permitting an amendment to the complaint given the substantial time and resources that the parties have devoted to this case, the apparent willingness of CMU to join in the action, and the fact that CMU is subject to the jurisdiction of the Court. In the alternative, we recommend that the District Court vacate its order dated December 14, 2007, denying UPitt's motion to join.

V.

CONCLUSION

We recommend that the motion of Varian Medical System's Inc. for summary judgment be granted without prejudice to UPitt filing an amended complaint in which CMU is added as a party plaintiff. In the alternative, we recommend that the District Court vacate the order dated December 14, 2007.

March 8, 2008



Donald E. Ziegler
Special Master

EXHIBIT H

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH,

Plaintiff,

07cv0491

ELECTRONICALLY FILED

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

**ORDER ADOPTING SPECIAL MASTER'S REPORT AND RECOMMENDATION
(DOC. NO. 254) IN PART; AND GRANTING DEFENDANT'S MOTION FOR
SUMMARY JUDGMENT FOR LACK OF STANDING (DOC. NO. 127)**

A. Defendant's Motion for Summary Judgment for Lack of Standing (Doc. No. 127)

On November 21, 2008, defendant filed a Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing (doc. no. 127). In essence, defendant sought dismissal of the case, arguing that since plaintiff was not the sole owner of the patents-in-suit because non-party CMU is a co-owner thereof, plaintiff lacks standing to sue for patent infringement. Said Motion was assigned to the Special Master pursuant to Text Order, dated November 26, 2007, and the matter thereafter was thoroughly briefed. See doc. nos. 127, 128, 130, 159, 160, 167, 170, 172.

B. Prior Related Order of Court

Instead of waiting for a ruling on said Motion by the Special Master, plaintiff filed with this Court, on December 5, 2007, a document entitled "Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University" (doc. no. 149). Defendant responded thereto with a document entitled "Defendant Varian

Medical Systems , Inc.'s Opposition to Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University" (doc. no. 162). By Order dated December 14, 2007 (doc. no. 168), the Court denied said Motion pursuant to the June 4, 2007 Case Management Order (doc. no. 30), because said Motion was untimely in that new parties were to be added approximately 6 months earlier, by June 15, 2007, and discovery previously had closed on October 5, 2007, except for specific limited discovery. See Case Management Order of June 4, 2007 (doc. no. 30).

Importantly, this denial (doc. no. 168) was consistent with the ruling of the Court denying, as untimely, defendant's Motion to Amend Answer (doc. no. 236) to add an affirmative defense and counterclaim of inequitable conduct. See doc. no. 236. Although plaintiff vigorously and successfully opposed this motion of defendant as untimely, plaintiff sought to add a new party (CMU) in a more untimely manner.

C. Report and Recommendation of Special Master (doc. no. 254)

The Special Master on March 10, 2008, by Report and Recommendation, recommended that said defendant's Motion for Summary Judgment for Lack of Sanding (doc. no. 127) be granted. The Special Master found that (a) the case must be dismissed if a co-owner of the patents-in-suit is not joined in the action; (b) CMU is a co-owner of the patents-in-suit, and at the time of the commencement of the action (and to the present time) had rights in the patents-in-suit, despite the transfer of certain substantial rights; and (c) CMU thus is a necessary party to this action. Thereafter, the Special Master "recommended that the District Court grant the Motion for Summary Judgment . . ."¹ This Court agrees with the analysis of the Special Master on this legal point, and approves and adopts the Report and Recommendation, in part, that the

¹The Special Master recommended the dismissal to be "without prejudice."

Motion for Summary Judgment for Lack of Standing (doc. no. 127) should be granted.

D. Dismissal With Prejudice

The next issue is whether the dismissal should be with or without prejudice. This issue has two (2) parts as follows: (1) Is the failure to join CMU as a necessary party correctable by adding CMU to the action now, after commencement of the case? - - an issue not addressed by Special Master; and (2) if the answer thereto is affirmative, should plaintiff in this particular case be permitted to add CMU as a party, approximately ten (10) months after the time to add new parties has closed, and approximately six (6) months after the close of discovery (see doc. no. 30), by this Court vacating its Order of December 14, 2007 (doc. no. 168) which denied plaintiff's prior Motion to Join CMU (doc. no. 149), and thus permitting plaintiff to file an Amended Complaint adding CMU?²

a. The Case Must be Dismissed Because CMU Should Have Been Joined at the Commencement of the Action

Generally, United States patent law requires that all co-owners normally must join as plaintiffs in an infringement suit. *International Nutrition Co. v. Horphag Research Ltd.*, 257 F.3d 1324, 1331 (Fed Cir. 2001). Where one co-owner possesses an undivided part of the entire patent, the joint owner must join all other co-owners to establish standing. *Israel Bio-*

²The Report and Recommendation stated as follows: "Although we recommend that the motion for summary judgment be granted, we recommend that it be granted without prejudice to UPitt to file an amended complaint, within thirty days, in which CMU is added as a party plaintiff, which would correct the standing deficiency. The interests of justice and judicial economy weigh in favor of permitting an amendment to the complaint given the substantial time and resources that the parties have devoted to this case, the apparent willingness of CMU to join in the action, and the fact that CMU is subject to the jurisdiction of the Court. In the alternative, we recommend that the District Court vacate its order dated December 14, 2007, denying UPitt's motion to join. * * * We recommend that the motion of Varian Medical System's Inc. for summary judgment be granted without prejudice to UPitt filing an amended complaint in which CMU is added as a party plaintiff. In the alternative, we recommend that the District Court vacate the order dated December 14, 2007." Doc. no. 254 at 10 and 11.

Engineering Project v. Amgen Inc., 401 F.3d 1299, 1305 (Fed Cir. 2005) (citing *Prima Tek II, L.L.C. v. A-Roo Co*, 222 F.3d 1372, 1377 (Fed Cir. 2000)). A contrary requirement would be in conflict with the text of Rule 19(a) of the Federal Rules of Civil Procedure. ("shall be joined as a party in the action if . . . the person claims an interest relating to the subject of the action and is so situated that the disposition of the action in the person's absence may . . . leave any persons already parties subject to *substantial risk of incurring double, multiple, or otherwise inconsistent obligations* by reason of the claimed interest.").

The majority of the authority holds simply that the co-owners must be joined and is silent on the issue of at *what point* they must be joined to the suit. However, one case from the Federal Circuit provides some guidance. In *International Gamco, Inc. v. Multimedia Games, Inc.* the Court stated:

Allowing a licensee, even one with exclusive rights to the patent for a particular field of use, to sue in its own name alone poses a substantial risk of multiple suits and even multiple liabilities against an alleged infringer for a single act of infringement. To alleviate this risk, this court's prudential standing requirement compels an exclusive licensee with less than all substantial rights, such as a field of use licensee, to join the patentee *before initiating suit*.

International Gamco, Inc. v. Multimedia Games, Inc., 504 F.3d 1273, 1278 (Fed Cir. 2007).

Also, the requirement that the plaintiffs be joined *at inception of the suit* may be implied from the lack of authority found holding that the plaintiffs need *not* be joined at the inception of the lawsuit.

b. The Case Also Must be Dismissed Because of the Plaintiff's Untimely Attempt to Add CMU as a Party

Additionally, this Court declines to vacate its prior Order (doc. no. 168) denying plaintiff's Motion to Join CMU (doc. no. 149). Plaintiff obviously knew of CMU's existence and its residual rights in the patents-in-suit, and chose not to join CMU, at the inception of this

case. Whether plaintiff's very sophisticated patent counsel made this tactical decision not to join CMU in order to make discovery of CMU as a non-party more difficult for defendant, or for some other tactical reason, the Court does not know. However, plaintiff's argument that since some discovery has been conducted relating to CMU, CMU can be added as a party, and the case can simply proceed, is not credible, as any review of the docket will establish. The request to add CMU was untimely and unfair to defendant on December 5, 2007 (doc. no. 149), and it is even more so now four (4) months later.³

Therefore, this Court respectfully rejects the Special Master's suggestion that this Court permit plaintiff to add CMU as a party at this very late date, and likewise declines to vacate this Court's Order of December 5, 2007 (doc. no. 168) denying plaintiff's Motion to Add CMU (doc. no. 149), for the reasons stated above.

³Defendant continues to oppose the untimely addition of non-party CMU to the litigation, including because of the additional expense of the litigation to deal with the CMU discovery and other issues; and requests a straight-forward ruling on Varian Medical System, Inc.'s Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing (doc. no. 127). The Court agrees.

CONCLUSION

Therefore, the Court will adopt in part the Report and Recommendation of the Special Master (doc. no. 254); the Court will sustain the objections contained in Defendant/Counterclaimant Varian Medical System Inc.'s Objections to Report and Recommendation of Special Master Re: Motion for Summary Judgment for Lack of Standing (doc. no. 256) relating to vacating the December 5, 2007 Order (see doc. nos. 255, 271, 272, 281); and the Court grants the Motion for Summary Judgment for Lack of Standing (doc. no. 127) and dismisses this action with prejudice.⁴

SO ORDERED this 30th day of April, 2008.

s/ Arthur J. Schwab
Arthur J. Schwab
United States District Judge

cc: All Registered ECF Counsel and Parties

⁴The Court's Order of Court Denying Plaintiff's Motion for Reconsideration of the Court's Findings of Contempt (doc. no. 284) and Granting in Part and Denying in Part Defendant Varian Medical Systems' Motion for Contempt Sanctions (doc. no. 286) (doc. no. 293) remains in effect.

EXHIBIT I

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)	
)	
Plaintiff,	)	FILED ELECTRONICALLY
)	
v.)	
)	
VARIAN MEDICAL SYSTEMS, INC.	)	Civil Action No. 2:07-CV-00491-AJS
)	
Defendant.	)	Judge Arthur J. Schwab
)	
)	

**PLAINTIFF UNIVERSITY OF PITTSBURGH'S MOTION
PURSUANT TO FEDERAL RULE OF CIVIL PROCEDURE 19
TO JOIN CARNEGIE MELLON UNIVERSITY**

I. INTRODUCTION

Plaintiff University of Pittsburgh (“UPitt”) hereby moves pursuant to Federal Rule of Civil Procedure 19 to join Carnegie Mellon University (“CMU”) as a party to the litigation. CMU retains certain rights in the patents-in-suit that arise from the involvement of CMU employees in the research that led to the claimed inventions. The precise scope of CMU’s rights in the patents-in-suit has not been definitively ascertained, and is currently the subject of a motion for summary judgment brought forth by Defendant Varian Medical Systems, Inc. (“Defendant”). Nevertheless, in the interest of efficiency, joinder of CMU is presently feasible because CMU is within the jurisdiction of the Court, and because CMU is willing to be added as a plaintiff to this action. CMU has already been an active participant in this litigation and has been forthcoming in providing all relevant discovery. CMU has responded to and appeared for a multi-topic Rule 30(b)(6) deposition that was noticed by Defendant. Accordingly, the case schedule will not be delayed by the addition of CMU as a party.

II. STATEMENT OF FACTS

The two patents-in-suit are U.S. Patent Nos. 5,727,554 (“the ’554 patent”) and 5,784,431 (“the ’431 patent”) (collectively, “the patents-in-suit”). The patents-in-suit were developed in part through a joint collaboration between CMU and UPitt. This joint collaboration between the universities began on or around 1993-1994. *See Declaration of Darcy A. Paul in Support of Plaintiff University of Pittsburgh’s Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University (“Paul Decl.”), Exhibit A (January 20, 1994 Letter from Dr. Greenberger to Dr. Kanade).* Two policies govern the ownership interests for the patents-in-suit (“Joint IP Guidelines”). *See Paul Decl., Exhibits B and C (respectively, 1994 and 1997 Joint Policy Guidelines).* Defendant maintains that CMU is a co-owner of the patents-in-suit. *See Doc. No. 127, Defendant’s Motion for Summary Judgment (“Defendant’s MSJ”).* UPitt disagrees with the substantive details of Defendant’s analysis, such as the scope of rights retained in the patents-in-suit by UPitt and CMU.

While UPitt disputes Defendant’s characterization regarding the scope of UPitt’s rights in the patents-in-suit, in the interest of judicial efficiency, CMU agreed to join as a plaintiff in the present litigation. *See Paul Decl., Exhibit D, Declaration of Robert A. Wooldridge, ¶ 2.* CMU is located in Pittsburgh, thus within this Court’s jurisdiction. CMU is an active participant in the present lawsuit, responding to Defendant’s discovery requests, as well as producing documents and witnesses for deposition. *Id.* at ¶ 3. Specifically, CMU has responded to Defendant’s 30(b)(6) discovery requests, produced documents, and two witnesses for deposition:

- June 13, 2007: Defendant served a subpoena on CMU requesting documents and testimony on 19 topics. *Id.* at ¶ 7.
- July 11, 2007: Defendant served a subpoena on Dr. Kanade, an employee of CMU.
- August 13, 2007: CMU produced documents in response to Defendant’s subpoena.

- August 13, 2007: Dr. Kanade produced documents in response to Defendant's subpoena.
- September 18, 2007: CMU produced additional documents in response to Defendant's subpoena. To date, CMU has produced 857 pages of documents in response to Defendant's discovery requests. *Id.* at ¶ 4.
- September 18, 2007: Dr. Kanade produced additional documents in response to Defendant's subpoena. To date, Dr. Kanade has produced 351 pages of documents in response to Defendant's discovery requests. *Id.* at ¶ 5.
- September 19, 2007: Defendant took the deposition of Dr. Kanade. *Id.* at ¶ 6.
- September 26, 2007: Defendant took the deposition of CMU's designee, Robert A. Wooldridge, for a nineteen (19) topic deposition pursuant to Federal Rule of Civil Procedure 30(b)(6). *Id.* at ¶ 7.

III. LEGAL STANDARDS

The requirement that all co-owners to a patent-in-suit must be joined to establish standing is a “prudential” requirement, distinguishable from the constitutional requirement for jurisdiction, and therefore may be cured by joining all owners to the action. *See Intellectual Property Development, Inc. v. TCI Cablevision of California*, 248 F.3d 1333, 1348-49 (Fed. Cir. 2001) (noting that jurisdictional defects may be cured by allowing the patent owner to be joined). The Federal Circuit generally favors adding the patentee or co-owner to the suit in order to establish standing. *See Prima Tek II*, 222 F.3d at 1377 (Fed. Cir. 2000) (“As a general rule, this court continues to adhere to the principle . . . that a patentee should be joined, either voluntarily or involuntarily, in any infringement suit brought by an exclusive licensee.”); *Abbott Laboratories v. Ortho Diagnostic Systems, Inc.*, 47 F.3d 1128, 1133 (“A patentee that does not voluntarily join an action prosecuted by its exclusive licensee can be joined as a defendant or, in a proper case, made an involuntary plaintiff if it is not subject to service of process.”).

This principle is essentially the same as the one set forth in Federal Rule of Civil

Procedure 19, which provides a set of considerations for determining when a party should be joined and whether to dismiss an action on the ground that a party who should be joined cannot be so joined. *See Prima Tek II*, 222 F.3d at 1377. Not surprisingly, courts look to Rule 19 in determining whether a co-owner of a patent must be joined. *See Abbott*, 47 F.3d at 1133 (recognizing that the purpose of Rule 19 is served by allowing a co-owner with a substantial interest in the patent-in-suit to join); *Biagro Western Sales, Inc. v. Helena Chemical Co.*, 160 F. Supp. 2d 1136, 1149 (E.D. Cal. May 7, 2001) (allowing plaintiff to join a patent co-owner under Rule 19 to cure a lack of standing). Significantly, Rule 19(a) mandates the joinder of a party whose joinder will not deprive the court of jurisdiction if:

- (1) in the person's absence complete relief cannot be accorded among those already parties, or (2) the person claims an interest relating to the subject of the action and is so situated that the disposition of the action in the person's absence may (i) as a practical matter impair or impede the person's ability to protect that interest or (ii) leave any of the persons already parties subject to a substantial risk of incurring double, multiple, or otherwise inconsistent obligations by reason of the claimed interest.

Id. Moreover, Rule 19(a) requires the court to join any necessary party if they have not already been joined, and if the necessary party refuses to join as a plaintiff, the party may be made an involuntary plaintiff.

IV. ARGUMENT

Defendant argues that CMU has substantial rights in the patents-in-suit to the present litigation, and as such, should be added as a plaintiff to the present litigation. *See* Defendant's MSJ, at p. 7. While UPitt disagrees with Defendant's characterization, in the interest of judicial efficiency, UPitt and CMU both agree that CMU may be added as a voluntary plaintiff to the present litigation. *See* Paul Decl., Exhibit D, Declaration of Robert A. Wooldridge, at ¶ 2.

CMU may be added as a voluntary plaintiff under Fed. R. Civ. P. Rule 19. Since CMU is located in Pittsburgh, Pennsylvania, it is subject to service of process by this Court. Defendant argues that absent CMU's participation, this Court cannot accord complete relief among the

existing parties. *See* Defendant's MSJ, at pp. 6-7. CMU and UPitt agree that CMU has some interest in the outcome of the present litigation. *See* Paul Decl., Exhibits B and C. Defendant essentially argues that, without CMU, it would be subject to a substantial risk of incurring double, multiple, or otherwise inconsistent obligations because of CMU's interest. *See* Defendant's MSJ, at pp. 6-7. As evidenced by its willingness to join, CMU does not object to this venue for adjudicating the present litigation. Further, the present venue is proper. These facts meet every element of Rule 19(a). Thus, Rule 19(a)(2) requires this Court to join CMU as a party to the present action.

With the joinder of CMU, Defendant's MSJ is rendered moot.

V. CONCLUSION

WHEREFORE, UPitt respectfully requests this Court to enter an Order in the form attached hereto, granting Plaintiff's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University.

DATED: December 5, 2007

Respectfully submitted,

/s/ Rita E. Tautkus

Daniel Johnson, Jr. (*pro hac vice*)
Rita E. Tautkus (*pro hac vice*)
Darcy A. Paul (*pro hac vice*)
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Square, Suite 700
3000 El Camino Real
Palo Alto, CA 94306
(650) 843-4000
(650) 843-4001 (facsimile)
djohnson@morganlewis.com
rtautkus@morganlewis.com
dpaul@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
MORGAN, LEWIS & BOCKIUS LLP
One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com

Attorneys For Plaintiff University Of Pittsburgh

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)
Plaintiff,) FILED ELECTRONICALLY
)
v.) Civil Action No. 2:07-cv-00491-AJS
VARIAN MEDICAL SYSTEMS, INC.)
Defendant.) Judge Arthur J. Schwab
)
)

**PROPOSED ORDER OF COURT GRANTING PLAINTIFF'S MOTION
PURSUANT TO FEDERAL RULE OF CIVIL PROCEDURE 19
TO JOIN CARNEGIE MELLON UNIVERSITY**

AND NOW, to-wit, this _____ day of December, 2007, upon consideration of Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University, it is hereby ORDERED, ADJUDGED and DECREED that the foregoing Motion is GRANTED. Carnegie Mellon University shall be joined as a Plaintiff in the present action, pursuant to Federal Rule of Civil Procedure 19.

BY THE COURT:

The Honorable Arthur J. Schwab
United States District Judge

Escamilla, Diane

From: ecf_intake_pawd@pawd.uscourts.gov
Sent: Wednesday, December 05, 2007 12:13 PM
To: pawd_ecf@pawd.uscourts.gov
Subject: Activity in Case 2:07-cv-00491-AJS UNIVERSITY OF PITTSBURGH v. VARIAN MEDICAL SYSTEMS, INC. Motion for Joinder

This is an automatic e-mail message generated by the CM/ECF system. Please DO NOT RESPOND to this e-mail because the mail box is unattended.

NOTE TO PUBLIC ACCESS USERS You may view the filed documents once without charge. To avoid later charges, download a copy of each document during this first viewing.

U.S. District Court

Western District of Pennsylvania

Notice of Electronic Filing

The following transaction was entered by Tautkus, Rita on 12/5/2007 at 3:13 PM EST and filed on 12/5/2007

Case Name: UNIVERSITY OF PITTSBURGH v. VARIAN MEDICAL SYSTEMS, INC.
Case Number: 2:07-cv-491
Filer: UNIVERSITY OF PITTSBURGH
Document Number: 149

Docket Text:

MOTION for Joinder Plaintiff University of Pittsburgh's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University by UNIVERSITY OF PITTSBURGH.
(Attachments: # (1) Proposed Order) (Tautkus, Rita)

2:07-cv-491 Notice has been electronically mailed to:

William L. Anthony , Jr wanthonry@orrick.com, shart@orrick.com

Bradford A. Cangro bcangro@morganlewis.com

Shannon M. Clougherty sclougherty@psmn.com

Michael F. Heafey mheafey@orrick.com

Daniel Johnson , Jr djjohnson@morganlewis.com

John R. Kenrick jkenrick@eckertseamans.com

Zheng Liu jenliu@orrick.com

Darcy A. Paul dpaul@morganlewis.com, ahoffman@morganlewis.com, mblakely@morganlewis.com, mboensch@morganlewis.com, michael.nguyen@morganlewis.com, mjensen@morganlewis.com, nnelson@morganlewis.com, tmajidian@morganlewis.com

John H. Perkins perkins@acba.org

Matthew H. Poppe mpoppe@orrick.com, descamilla@orrick.com, jryan@orrick.com

Christopher K. Ramsey cramsey@morganlewis.com, dbilski@morganlewis.com, kxander@morganlewis.com, pbaron@morganlewis.com

M. Brendan Smith mbsmith@orrick.com

Henry M. Sneath hsneath@psmn.com, rcorbin@psmn.com, tslahtovsky@psmn.com

Rita E. Tautkus rtautkus@morganlewis.com

Allison K. Young allison.young@morganlewis.com, ahoffman@morganlewis.com, mboensch@morganlewis.com, mjensen@morganlewis.com, nnelson@morganlewis.com, talexander@morganlewis.com, tmajidian@morganlewis.com

John D. Zele jzele@morganlewis.com

Donald E. Ziegler coopzieg@aol.com

2:07-cv-491 Filer will deliver notice by other means to:

The following document(s) are associated with this transaction:

Document description:Main Document

Original filename:n/a

Electronic document Stamp:

[STAMP_dcecfStamp_ID=1098469114 [Date=12/5/2007] [FileNumber=1183981-0] [052a9573e9528ba26b0da8e96b496877a83aa0b5fd700e211c2158e016a6003bafb 49290886c370559581dd77cb3ece6f76f582b29c5193e488cdd80edcb7f30]]

Document description:Proposed Order

Original filename:n/a

Electronic document Stamp:

[STAMP_dcecfStamp_ID=1098469114 [Date=12/5/2007] [FileNumber=1183981-1] [60d3dfa8e75501d1c2066b3c90f1db791e6f321b7137bec0e81a2a7e8be1dd5e20e 5f8b2b1b28a889e32119a87857640554b42905c477d6cf07b7fb5c0c2a34c]]

EXHIBIT J

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH

Plaintiff,

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

Case 2:07-cv-00491-AJS

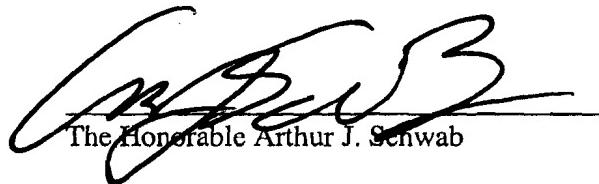
Judge Arthur J. Schwab

Filed Electronically

**ORDER DENYING PLAINTIFF'S MOTION TO JOIN
CARNEGIE MELLON UNIVERSITY**

AND NOW, this 14th day of December, 2007, after consideration of Plaintiff's Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie
(doc. no. 149)
Mellon University, it is hereby ORDERED that said Motion is DENIED.

BY THE COURT:


The Honorable Arthur J. Schwab

and Defendant's
response
Brief (doc. no.
162),

EXHIBIT K

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH

Plaintiff,

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

Case 2:07-cv-00491-AJS

Judge Arthur J. Schwab

Filed Electronically

**DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S
OBJECTIONS TO REPORT AND RECOMMENDATION OF SPECIAL MASTER RE:
MOTION FOR SUMMARY JUDGMENT FOR LACK OF STANDING**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. RELEVANT PROCEDURAL HISTORY	2
A. Case Status	2
B. Varian's Summary Judgment Motion and UPitt's Response	2
C. The Special Master's Report and Recommendation.....	3
III. ARGUMENT.....	3
A. The Special Master's Recommendation to Add CMU as a Plaintiff Was Not Briefed by the Parties, It Does Not Cite Authority, and It Does Not Address Varian's Anti-Joinder Arguments.....	3
B. Joining CMU Will Not "Correct" UPitt's Lack of Standing Because Co- Owners Must Be Named as Plaintiffs at the Inception of a Patent Suit	4
C. UPitt's Lack of Diligence and False Statements Preclude a Finding of Good Cause to Add CMU as a Party	5
D. Varian Would Be Severely Prejudiced If CMU Were to Be Added as a Party at This Late Date	7
E. Permitting UPitt to Amend Its Complaint Now After Denying Varian That Same Opportunity Would Create an Unfair Double Standard.....	9
F. Reconsideration of the Court's Prior Order Denying UPitt's Motion to Join CMU Is Not Warranted	10
IV. CONCLUSION.....	10

TABLE OF AUTHORITIES

	Page
FEDERAL CASES	
<i>Alcatel USA, Inc. v. Orckit Communications,</i> 2000 WL 502846 (N.D. Cal. Apr. 13, 2000)	4
<i>Arizona v. California,</i> 460 U.S. 605, 103 S. Ct. 1382 (1983).....	10
<i>Arnold v. BLaST Intermediate Unit 17,</i> 843 F.2d 122 (3d Cir. 1988).....	7
<i>Componentone, L.L.C. v. Componentart, Inc.,</i> 2007 WL 2580635 (W.D. Pa. Aug. 16, 2007)	5
<i>Christianson v. Colt Indus. Operating Corp.,</i> 486 U.S. 800, 108 S. Ct. 2166 (1988).....	10
<i>Lans v. Digital Equipment Corp.,</i> 252 F.3d 1320 (Fed. Cir. 2001).....	7
<i>Municipal Revenue Services, Inc. v. Xspand, Inc.,</i> 2006 WL 91358 (M.D. Pa. Jan 12, 2006).....	3
<i>Paradise Creations, Inc. v. UV Sales, Inc.,</i> 315 F.3d 1304 (Fed. Cir. 2003).....	4
<i>Switzer Bros., Inc. v. Byrne,</i> 242 F.2d 909 (6th Cir. 1957)	4
<i>Willingham v. Star Cutter Co.,</i> 555 F.2d 1340 (6th Cir. 1977)	4

FEDERAL STATUTES AND RULES

Fed. R. Civ. P. 16(b)	5
Fed. R. Civ. P. 53(g)	4
Fed. R. Evid. 804(b)(1).....	8
L.R. 7.1(E)	10

TABLE OF AUTHORITIES

	Page
STATE CASES	
<i>Varian Medical Systems, Inc. v. Delfino,</i> 25 Cal. Rptr. 3d 298 (2005)	9
MISCELLANEOUS	
<i>4 Moore's Federal Practice</i> (3d ed. 2007)	3

I. INTRODUCTION

Defendant Varian Medical Systems, Inc. (“Varian”) agrees with the Special Master’s recommendation that Varian’s motion for summary judgment be granted. The Special Master correctly found that there is no genuine issue as to the following material facts: Plaintiff University of Pittsburgh (“UPitt”) does not own all substantial rights in the patents-in-suit; non-party Carnegie Mellon University (“CMU”) is a co-owner of those patents; and, consequently, UPitt lacks standing to sue for patent infringement.

However, Varian disagrees with the Report and Recommendation (“R&R”) regarding certain matters that were not briefed. Specifically, the Special Master recommended that the Court permit CMU to be added as a plaintiff, either by “permitting an amendment to the complaint” or by “vacat[ing] its order dated December 14, 2007, denying UPitt’s motion to join.” *See* Docket No. 254 at 2, 10, 11. The Special Master also recommended that summary judgment be granted “without prejudice. *Id.* Those recommendations should not be followed. This Court properly denied UPitt’s joinder motion three months ago. *See* Docket No. 168. The Special Master did not have before him Varian’s arguments in opposition to the joinder motion, and they are not addressed in the R&R. Those arguments include the following:

- Joinder will not cure lack of standing. Case law holds that a patent plaintiff must have standing at the inception of a lawsuit. Standing cannot be conferred through procedural games late in a case.
- UPitt did not act diligently. UPitt cannot show good cause to add a new party nine months after the court-ordered deadline because it did not act diligently. The relevant evidence has always been in UPitt’s possession and UPitt has treated CMU as a co-owner in other situations, so UPitt has no excuse for not joining CMU earlier. Nor can UPitt justify the false statements it made about ownership in its Complaint and interrogatory responses.
- Varian would be prejudiced. Adding a new party at this stage of the litigation would severely prejudice Varian. Varian cannot obtain discovery from CMU because discovery is closed; Varian’s ability to use previously-obtained deposition testimony against CMU at trial is unclear; and adding CMU as a party

now would expose Varian to the risk that a victory in this Court may be subject to a jurisdictional attack on appeal.

The Special Master also did not have before him the fact that Varian's own motion for leave to amend was recently denied on grounds of untimeliness and prejudice. *See* Docket No. 252. Permitting UPitt to amend its complaint to add a party now would unjustifiably create a double standard given that even more time has passed, UPitt has no excuse for its delay, and the prejudice to Varian would be much greater than that to UPitt had Varian's motion been granted.

Accordingly, Varian respectfully objects to the portions of the R&R identified above.

II. RELEVANT PROCEDURAL HISTORY

A. Case Status

UPitt filed this action against Varian on April 13, 2007. *See* Docket No. 1. UPitt falsely alleged in its Complaint that it was "the owner of the entire right, title and interest in and to" the patents-in-suit. *Id.* ¶ 5. That false allegation made it necessary for Varian to go to great effort and expense to discover and prove CMU's co-ownership and UPitt's lack of standing.

On June 4, 2007, the Court entered a Case Management Order setting June 15, 2007 as the deadline to amend the pleadings or add new parties. *See* Docket No. 30, ¶ 4. The Order also provided for fact discovery to end on October 5, 2007 and the claim construction process to conclude on November 29, 2007. *Id.* ¶¶ 10, 14. Fact discovery is now closed and a claim construction order is pending.

B. Varian's Summary Judgment Motion and UPitt's Response

On November 21, 2007, Varian filed the present Motion for Summary Judgment based on UPitt's lack of standing to sue for patent infringement. *See* Docket Nos. 127-130. The Court referred the motion to the Honorable Donald E. Ziegler. Opposition and reply papers were filed on December 5 and 13, 2007, respectively. *See* Docket Nos. 153-154, 159-161, 166-167.

Concurrently with its opposition, UPitt filed a “Motion Pursuant to Federal Rule of Civil Procedure 19 to Join Carnegie Mellon University.” Docket Nos. 149-150, 158. Varian filed an opposition on December 12, 2007. Docket Nos. 162-163. The Court denied the joinder motion on December 14, 2007. Docket No. 168.

C. The Special Master’s Report and Recommendation

On March 8, 2008, the Special Master issued an R&R on Varian’s summary judgment motion. The Special Master agreed with Varian that CMU is a co-owner of the patents-in-suit, CMU did not transfer all “substantial rights” in the patents to UPitt, and UPitt consequently lacks standing to sue Varian for patent infringement. *See* Docket No. 254 at 6-10.

The Special Master went beyond those recommendations, however, and addressed further issues not briefed by the parties. Specifically, he recommended that the summary judgment motion be granted “without prejudice to UPitt to file an amended complaint, within thirty days, in which CMU is added as a party plaintiff” Docket No. 254 at 10. In the alternative, he recommended “that the District Court vacate its order dated December 14, 2007, denying UPitt’s motion to join.”¹ *Id.* These are the recommendations with which Varian respectfully takes issue.

III. ARGUMENT

A. The Special Master’s Recommendation to Add CMU as a Plaintiff Was Not Briefed by the Parties, It Does Not Cite Authority, and It Does Not Address Varian’s Arguments Against Joinder

The Special Master’s recommendation that CMU be added as a plaintiff to “correct the standing deficiency” should not be adopted. His recommended form of relief was not addressed

¹ There is no meaningful distinction between the two alternatives because joining a party requires an amendment to the complaint. *See 4 Moore’s Federal Practice* § 20.02[2][a][ii], at 20-12 (3d ed. 2007) (plaintiff who fails to join parties at outset of case “may do so only by amending the complaint”). This assures the defendant its due process right to file a responsive pleading when a new party is added. *See, e.g., Municipal Revenue Services, Inc. v. Xspand, Inc.*, 2006 WL 91358 (M.D. Pa. Jan 12, 2006).

in the parties' summary judgment briefs.² In addition, he was not given Varian's opposition to UPitt's joinder motion. There is no indication in the R&R that he considered Varian's arguments or authorities, and he did not cite any supporting legal authority of his own. *See* Docket No. 254 at 10. Varian's legal arguments and authorities are repeated below for the Court's convenience along with other pertinent arguments and authorities. Because the R&R does not address those arguments or authorities, it should not be accorded any deference on this point (and is subject to *de novo* review in any event, *see Fed. R. Civ. P. 53(g)*).

B. Joining CMU Will Not "Correct" UPitt's Lack of Standing Because Co-Owners Must Be Named as Plaintiffs at the Inception of a Patent Suit

CMU's joinder at this late date is impermissible because "all co-owners of a patent must join in an infringement suit *at its inception.*" *Willingham v. Star Cutter Co.*, 555 F.2d 1340, 1343 (6th Cir. 1977) (emphasis added). "Patent law dictates that standing is determined by the parties' rights on the date suit is filed." *Alcatel USA, Inc. v. Orcket Communications*, 2000 WL 502846, *2 (N.D. Cal. Apr. 13, 2000); *see also Paradise Creations, Inc. v. UV Sales, Inc.*, 315 F.3d 1304, 1309 (Fed. Cir. 2003) ("in order to assert standing for patent infringement, the plaintiff must demonstrate that it held enforceable title to the patent *at the inception of the lawsuit*") (emphasis in original). Thus, in *Switzer Bros., Inc. v. Byrne*, 242 F.2d 909 (6th Cir. 1957), the court affirmed an order dismissing a patent infringement complaint where two co-owners were not joined as plaintiffs when the suit was filed. The court held that this jurisdictional defect was not cured by a post-filing assignment of all rights in the patents-in-suit to the parties by the other co-owners. *Id.* at 913. It also affirmed the district court's order denying leave to add the other co-owners as parties. *Id.* "The right of the plaintiff to recover

² In a half-page section of its summary judgment opposition brief, UPitt mentioned that it had filed a motion to join CMU as a plaintiff. *See* Docket No. 159 at 10-11. However, UPitt did not repeat its joinder arguments in any detail, cite any supporting authority, or respond to Varian's counter-arguments. *See id.*

depended upon its right at the inception of the suit and the nonexistence of a cause of action when the suit was started is a fatal defect which cannot be cured by the accrual of a cause of action pending suit.” *Id.*

C. UPitt’s Lack of Diligence and False Statements Preclude a Finding of Good Cause to Add CMU as a Party

UPitt also has not shown (and cannot show) good cause to add a party after the deadline established in the Case Management Order. *See Fed. R. Civ. P. 16(b)* (“A schedule shall not be modified except upon a showing of good cause and by leave of the district judge . . .”); *Componentone, L.L.C. v. Componentart, Inc.*, 2007 WL 2580635, *1-*2 (W.D. Pa. Aug. 16, 2007). “‘Good cause’ under Rule 16(b) focuses on the diligence of the party seeking the modification of the scheduling order.” *Componentone, L.L.C.*, 2007 WL 2580635 at *2. Also relevant is whether the opposing party would be prejudiced. *See id.*

UPitt failed to establish good cause because it did not act diligently to add CMU as a party. In *Componentone, L.L.C.*, the court denied the plaintiff’s motion to add a new party on the grounds that the plaintiff should have been aware of the other party and its relevant conduct when the plaintiff filed the original complaint. *See id.* at *2. The same reasoning applies here.

All of the facts showing that CMU is a co-owner of the patents-in-suit and thus a necessary party were in UPitt’s possession when it filed this lawsuit in April 2007, and UPitt’s actions prior to filing suit show that it was cognizant of these facts and CMU’s retention of substantial rights. Three CMU researchers are named on the face of the patents, which are attached as exhibits to the Complaint. *See Docket No. 1; Docket No. 254 at 2-3.* In addition, UPitt is a party to Intellectual Property Policy Guidelines that were jointly adopted by UPitt and CMU and which UPitt admits govern the two universities’ respective rights with respect to the patents-in-suit. *See id.* at 3-5. The Guidelines declare that jointly developed patents such as the

patents-in-suit “shall be owned jointly by” UPitt and CMU. *Id.* Furthermore, prior to filing this lawsuit, UPitt repeatedly acted in a manner that showed its understanding that CMU was a co-owner of the patents-in-suit. *See id.* at 5-6. For example, when UPitt was negotiating a license with Varian in 2002, UPitt sought approval from CMU as to the licensing terms to be offered. *Id.* In addition, in 1998, UPitt and CMU entered into an agreement with a company called Elekta in which UPitt and CMU *jointly* granted Elekta an option to negotiate an exclusive license to the patents-in-suit. *Id.* From the foregoing, it is difficult to avoid the conclusion that UPitt acted willfully in failing to include CMU as a plaintiff from the outset of this lawsuit. At best, UPitt is guilty of gross negligence in failing to perform a reasonable investigation of patent ownership prior to filing suit.

UPitt’s culpability in failing to join CMU in a timely way is compounded by the false statements UPitt made to direct attention away from CMU’s co-ownership of the patents during this litigation. In particular, UPitt affirmatively and falsely alleged in the Complaint that it was “the owner of the entire right, title and interest in and to” the patents-in-suit. *See* Docket No. 1, ¶ 5. The Special Master’s R&R proves the falsity of that allegation. UPitt went even further in interrogatory responses that it signed under oath, in which it asserted that “there has been no actual transfer of ownership or transfer or license of rights relating to any patents-in-suit.” Exhibit A, pp. 2-3; Exhibit B, p. 4. UPitt has admitted the falsity of this assertion elsewhere, stating in a brief that the Intellectual Property Policy Guidelines mentioned above “transferred to UPitt broad rights” with respect to the patents-in-suit and had the effect of granting “all substantial rights in the Patents-In-Suit” to UPitt. *See* Docket No. 153 at 4, 10. UPitt cannot show good cause to add CMU as a party now when it has done everything in its power to stand in the way of that result throughout the rest of this litigation.

From the above discussion, it can be seen that there are substantial parallels between the present case and *Lans v. Digital Equipment Corp.*, 252 F.3d 1320 (Fed. Cir. 2001), in which the court both held that plaintiff lacked standing to sue for patent infringement and upheld the denial of plaintiff's motion to amend the complaint to substitute another plaintiff. The court reasoned:

[Plaintiff] purported to own a patent he did not actually own. [Plaintiff] did not disclose the actual owner until [defendants] discovered the assignment to [third party owner], and even then he equivocated. Thus, **[plaintiff's] personal choices occasioned his standing problems and the need to amend.** Indeed the trial court found that [plaintiff's] original allegations were not honest and understandable mistakes. Under these circumstances, **the district court remained well within its broad discretion in denying [plaintiff's] motion for leave to amend his complaint.**

Id. at 1328-29 (emphasis added). The same observations and reasoning apply equally here.

D. Varian Would Be Severely Prejudiced If CMU Were to Be Added as a Party at This Late Date

Joining CMU would also be improper because it would severely prejudice Varian given that this case is eleven months old, fact discovery is closed, and a claim construction hearing has already been held. *See, e.g., Arnold v. BLaST Intermediate Unit 17*, 843 F.2d 122, 125 n.6 (3d Cir. 1988) (joinder not permitted where there had been “ample opportunity” to join the party earlier, even though denial of joinder might necessitate a separate action against the party).

Pursuant to the Case Management Order, discovery in this case closed on October 5, 2007. *See* Docket No. 30, ¶ 10. UPitt argued in its joinder motion that Varian already obtained discovery from CMU pursuant to subpoena. However, Varian would have had additional discovery tools available to it if CMU had been a party during the discovery period, and Varian would have had reason to seek broader discovery from CMU if CMU were a co-plaintiff. For example, interrogatories may not be propounded to non-parties. If CMU had been named as a plaintiff in this action, Varian would have propounded interrogatories to CMU to learn its contentions regarding relevant issues in the case. Varian also would have had the benefit of

receiving Rule 26(a) disclosures and Infringement Contentions from CMU. Varian also engaged in narrower document and deposition discovery from CMU than it would have if CMU had been a party. This can be seen by comparing the document requests and deposition topics in the subpoenas Varian issued to CMU with the document requests and deposition topics that Varian propounded to UPitt. *Compare* Exhibits C, D *with* Exhibits E, F. Varian engaged in this narrower discovery because (1) non-parties are generally not expected to undergo the same discovery burdens as parties and (2) CMU's status as a non-party meant that it was not worthwhile seeking certain types of information (relating to such issues as damages, patent marking, and laches) that would have been relevant had CMU been a plaintiff.

Varian may also be prejudiced at trial in connection with the use of deposition testimony if CMU is added as a party. Several witnesses have been deposed who are unlikely to appear willingly at trial and who appear to reside outside the Court's subpoena power. These include Andre Kalend (an inventor in West Virginia), Karun Shimoga (an inventor in California), Charalambos Athanassiou (an inventor in Pittsburgh who has spent substantial amounts of time in Greece during recent years and was unavailable for much of the discovery period), Majid Riaziat (a former Varian engineer in California), Jack Coats (a former Varian employee in Maryland), and Dennis Quagliani (a former employee of non-party Elekta, Inc. in Georgia). Varian probably will not be able to call them as live witnesses at trial and thus may need to present their deposition testimony. However, Varian may be precluded from using their testimony against CMU because CMU was not present at their depositions and arguably lacked a meaningful opportunity to examine the witnesses as required by Fed. R. Evid. 804(b)(1).

Varian also would face substantial risks due to the jurisdictional issues created by CMU's late additional as a party. Even if this Court concludes that UPitt's lack of standing can be cured

by adding CMU as a party, the Court of Appeal might disagree. As a result, Varian might continue to devote substantial resources to defending itself in this action, obtain a victory through summary judgment or trial, and then see its favorable judgment voided by an appellate court finding of no jurisdiction. Varian recently suffered this fate in another case and wants to avoid a repeat. *See Varian Medical Systems, Inc. v. Delfino*, 25 Cal. Rptr. 3d 298 (2005). The resulting duplication of proceedings would victimize the Court as well as Varian.

Finally, Varian cannot foresee all possible ways that UPitt and/or CMU might seek to take advantage of CMU's late addition as a party. For example, CMU might raise unexpected arguments or issues that Varian did not have the opportunity to explore during discovery because CMU was not a party at that time. Adding CMU as a party would thus unfairly expose Varian to the risk of being blindsided by unforeseen issues in the future.

E. Permitting UPitt to Amend Its Complaint Now After Denying Varian That Same Opportunity is Contrary to the Standard Espoused by UPitt in This Case

Varian previously moved to amend its answer to add an inequitable conduct defense based on documents that were produced by UPitt after the close of discovery. *See* Docket Nos. 236-237. UPitt opposed the motion on the primary grounds of untimeliness and prejudice. UPitt argued that the delay therein (which was less of a delay than the current circumstance and at least some of which was caused by UPitt's late production), justified denying Varian leave to amend to add a substantial defense. *See* Docket Nos. 248-249. The Court denied the motion on those grounds. *See* Docket No. 252. UPitt's motion to join CMU as a party compares very unfavorably to Varian's motion to amend with respect to both untimeliness and prejudice.

F. Reconsideration of the Court's Prior Order Denying UPitt's Motion to Join CMU Is Not Warranted

A final reason for declining to adopt the Special Master's recommendation to permit CMU's addition as a party is that it would require reconsideration of the Court's prior order denying UPitt's Motion to Join. *See* Docket No. 168. Although the Court may have the power to revisit its prior ruling, "as a rule courts should be loathe to do so in the absence of extraordinary circumstances such as where the initial decision was 'clearly erroneous and would work a manifest injustice.'" *Christianson v. Colt Indus. Operating Corp.*, 486 U.S. 800, 817, 108 S. Ct. 2166, 2178 (1988) (quoting *Arizona v. California*, 460 U.S. 605, 618 n.8, 103 S. Ct. 1382, 1391 n.8 (1983)). There are no such extraordinary circumstances present here. Revisiting the joinder issue now also would be contrary to L.R. 7.1(E), which requires that a non-dispositive motion ordinarily be resolved within 30 days after it is filed. UPitt's joinder motion was filed more than three months ago.

IV. CONCLUSION

For the above reasons, Varian respectfully objects to the portion of the Special Master's R&R recommending that Varian's motion for summary judgment on the issue of standing be granted "without prejudice" and that either (1) UPitt be permitted to amend its complaint to add CMU as a party or (2) the Court vacate its prior order denying UPitt's motion to join CMU. The Court should otherwise adopt the R&R, grant summary judgment in Varian's favor on the issue of standing, and enter judgment against UPitt on that basis.

Respectfully submitted,

PICADIO SNEATH MILLER & NORTON, P.C.

By: /s/ Henry M. Sneath

Henry M. Sneath, Esquire

(Pa. I.D. No. 40559)

hsneath@psmn.com

Shannon M. Clougherty, Esquire

(Pa. I.D. No. 88586)

sclougherty@psmn.com

600 Grant Street, Suite 4710

Pittsburgh, PA 15219

(412) 288-4000 [T]

(412) 288-2405 [F]

ORRICK, HERRINGTON & SUTCLIFFE LLP

William L. Anthony, Jr. (admitted *pro hac vice*) (CA 106908)

Matthew H. Poppe (admitted *pro hac vice*) (CA 177854)

Zheng (Jen) Liu (admitted *pro hac vice*) (CA 229311)

1000 Marsh Road

Menlo Park, CA 94025

(650) 614-7400

(650) 614-7401 (fax)

wanthon@orrick.com

mpoppe@orrick.com

jenliu@orrick.com

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S OBJECTIONS TO REPORT AND RECOMMENDATION OF SPECIAL MASTER RE: MOTION FOR SUMMARY JUDGMENT FOR LACK OF STANDING was served upon all parties either individually or through counsel via:

- Hand-Delivery
 Facsimile
 First Class, US Mail, Postage Prepaid
 Certified Mail-Return Receipt Requested
 ECF Electronic Service
 Overnight Delivery

at the following addresses:

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: March 18, 2008

/s/ Henry M. Sneath
Henry M. Sneath

EXHIBIT L

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH

Plaintiff,

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

Case 2:07-cv-00491-AJS

Judge Arthur J. Schwab

Filed Electronically

**DECLARATION OF HENRY M. SNEATH IN SUPPORT OF
DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S
OBJECTIONS TO REPORT AND RECOMMENDATION OF SPECIAL
MASTER RE: MOTION FOR SUMMARY JUDGMENT FOR LACK OF
STANDING**

I, Henry M. Sneath, declare:

1. I am a partner in the law firm of Picadio Sneath Miller & Norton, P.C., counsel of record for defendant Varian Medical Systems, Inc. ("Varian") in this action. I am licensed to practice law in the State of Pennsylvania. I have personal knowledge of the facts stated herein, except where otherwise stated, and I could and would testify to those facts if called as a witness.

2. Attached hereto as Exhibit A is a true and correct copy of "University of Pittsburgh's Responses and Objections to Defendant Varian Medical Systems, Inc.'s First Set of Interrogatories," served on June 25, 2007.

3. Attached hereto as Exhibit B is a true and correct copy of "University of Pittsburgh Supplemental Responses and Objections to Defendant Varian Medical Systems, Inc.'s First Set of Interrogatories," served on September 10, 2007.

4. Attached hereto as Exhibit C is a true and correct copy of a subpoena issued in this action by Varian to Carnegie Mellon University on June 13, 2007.

5. Attached hereto as Exhibit D is a true and correct copy of a subpoena issued in this action by Varian to Carnegie Mellon University on September 11, 2007.

6. Attached hereto as Exhibit E is a true and correct copy of "Defendant and Counter-Plaintiff Varian Medical Systems, Inc.'s Request for Production of Documents Under Rule 34", which Varian served on University of Pittsburgh in this action on or about May 23, 2007.

7. Attached hereto as Exhibit F is a true and correct copy of "Defendant Varian Medical Systems, Inc.'s Notice of Deposition of Plaintiff University of Pittsburgh Pursuant to F.R.C.P. 30(b)(6)", which Varian served on University of Pittsburgh in this action on or about September 13, 2007.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed in Pittsburgh, Pennsylvania on March 18, 2008.

Respectfully submitted,

PICADIO SNEATH MILLER & NORTON, P.C.

By: /s/ Henry M. Sneath
PICADIO SNEATH MILLER & NORTON, P.C.

Henry M. Sneath, Esquire
hsneath@psmn.com
Pa. I.D. No. 40559
Shannon M. Clougherty, Esquire
sclougherty@psmn.com
Pa. I.D. No. 88586
600 Grant Street, Suite 4710
Pittsburgh, PA 15219
(412) 288-4000 [T]
(412) 288-2405 [F]

ORRICK, HERRINGTON & SUTCLIFFE LLP

William L. Anthony, Jr. (admitted *pro hac vice*) (CA 106908)
Matthew H. Poppe (admitted *pro hac vice*) (CA 177854)
Zheng (Jen) Liu (admitted *pro hac vice*) (CA 229311)
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
(650) 614-7401 (fax)
wanthony@orrick.com
mpoppe@orrick.com
jenliu@orrick.com

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the **DECLARATION OF HENRY M. SNEATH IN SUPPORT OF DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S OBJECTIONS TO REPORT AND RECOMMENDATION OF SPECIAL MASTER RE: MOTION FOR SUMMARY JUDGMENT FOR LACK OF STANDING** was served upon all parties either individually or through counsel via:

- | | |
|-------------------------------|---|
| <hr/> <hr/> <hr/> <hr/> <hr/> | Hand-Delivery |
| <hr/> <hr/> <hr/> <hr/> <hr/> | Facsimile |
| <hr/> <hr/> <hr/> <hr/> <hr/> | First Class, US Mail, Postage Prepaid |
| <hr/> <hr/> <hr/> <hr/> <hr/> | Certified Mail-Return Receipt Requested |
| <hr/> <hr/> <hr/> <hr/> <hr/> | X ECF Electronic Service |
| <hr/> <hr/> <hr/> <hr/> <hr/> | Overnight Delivery |

at the following addresses:

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: March 18, 2008

/s/ *Henry M. Sneath*

Henry M. Sneath

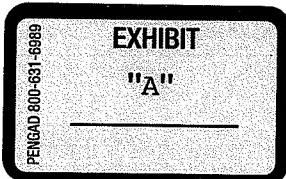
**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

UNIVERSITY OF PITTSBURGH,)	
Plaintiff,	)	CIVIL ACTION No. 2:07-cv-00491-AJS
v.	)	Judge Arthur J. Schwab
VARIAN MEDICAL SYSTEMS, INC.,	)	UNIVERSITY OF PITTSBURGH'S RESPONSES AND OBJECTIONS TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES
Defendant.)	

Pursuant to Rule 33 of the Federal Rules of Civil Procedure, Plaintiff University of Pittsburgh submits its Answers and Objections to Defendant Varian Medical Systems, Inc.'s First Set of Interrogatories.

GENERAL OBJECTIONS

1. University of Pittsburgh (hereafter "UPitt") objects to the definitions, instructions, and interrogatories of Varian Medical Systems, Inc. (hereafter "Varian") to the extent they seek to impose obligations on UPitt in excess of those stated in the Federal Rules of Civil Procedure. Subject to and without waiving this objection, UPitt will respond to the interrogatories only as required by those rules.
2. UPitt objects to Varian's interrogatories to the extent that they are overly broad, vague, ambiguous and unduly burdensome in that they do not clearly define what information is requested or because they are not reasonably limited in scope and time.
3. UPitt objects to Varian's interrogatories to the extent that they seek information not relevant to the subject matter involved in the pending action, or information not reasonably calculated to lead to the discovery of admissible evidence.



4. UPitt objects to Varian's interrogatories to the extent that they seek information not available to UPitt at this time. The responses are based on information currently available to UPitt, subject to any applicable objection. The responses are to the best of UPitt's present ability and information. UPitt reserves the right to supplement any response at a later date, even after completion of discovery, as well as the right to introduce evidence at the time of trial based upon information and/or documents subsequently located, developed, or discovered which evidence may supplement, amplify, modify, or conflict with these responses.

ANSWERS AND OBJECTIONS TO FIRST SET OF INTERROGATORIES

INTERROGATORY 1:

State all facts and identify all documents, communications and things concerning any actual or contemplated transfer of ownership or transfer or license of rights relating to any patents-in-suit, including any actual or contemplated contracts, transfer agreements, option agreement, licenses or assignments or communications relating to the same, between Plaintiff and any third party.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is on-going in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that there has been no actual transfer of

ownership or transfer or license of rights relating to any patents-in-suit. UPitt and Defendant Varian engaged in two rounds of discussions related to Varian's contemplated licensing of the patents-in-suit. The first round occurred prior to May 30, 2002 and continued through September 9, 2002, as evidenced by documents already produced in this case (see, e.g., PITT00002230-PITT00002244). The second round of discussions occurred between November 16, 2005 and December 13, 2006, as evidenced by documents already produced in this case (see, e.g., PITT00001625-PITT00001672, PITT00002018-PITT00002054, and PITT00002161-PITT00002218). While contemplated, neither set of discussions resulted in Varian actually taking a license of the patents-in-suit.

UPitt further responds that it engaged in a sponsored research relationship with Elekta on November 11, 1998. The sponsored research agreement contained an option for Elekta to take an exclusive license in the patents-in-suit, however, that option was never exercised. UPitt will produce additional relevant non-privileged documents responsive to this request.

INTERROGATORY 2:

For each asserted claim of the Patent-in-Suit, describe the circumstances surrounding the invention of the claim, including but not limited to, the precise date of conception, the persons involved, the Date of actual reduction to practice whether before or after Any Filing Date, the identity of Any corroborating witness, the steps constituting diligence from conception to actual or constructive reduction to practice, and Identify Any resulting devices and Identify Any Documents supporting these facts.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on

the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds, based on information located after a reasonably diligent search, that the answer to this interrogatory may be derived or ascertained from documents produced by UPitt including: Bates Nos. PITT00001570-PITT00001572, PITT00001680, PITT00001693-PITT00001705, PITT00001738-PITT00001742, PITT00001757-PITT00001875, PITT00001879-PITT00001881, PITT00001985, and PITT00001998-PITT00002008. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

INTERROGATORY 3:

Identify all prior art and all articles, references, products (whether on-sale or in public use) or other evidence that Plaintiff is aware of or that Any person or entity, including Any patent agency, has contended or asserted is prior art or otherwise relevant to the validity or invalidity of Any claim of the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds, based on information located after a reasonably diligent search, that the answer to this interrogatory may be derived or ascertained from documents produced by UPitt including: Bates Nos. PITT00000019-PITT00000216 (Prosecution history of U.S. Patent No. 5,727,554), PITT00000234-PITT00000484 (Prosecution history of U.S. Patent No. 5,784,431), and further UPitt will produce all foreign applications in its possession, custody or control.

INTERROGATORY 4:

For each Accused Varian Product Plaintiff believes as Infringing Any asserted claims of the Patents-in-Suit, state all facts concerning Plaintiff forming its belief that that such product Infringes, including, but not limited to, the Date that Plaintiff first learned of the product, the Date Plaintiff first came to believe the product was Infringing, the persons, documents and things involved in informing Plaintiff about the product and informing Plaintiff's belief that the product is Infringing, and all efforts that Plaintiff undertook to substantiate its belief that the product is Infringing, including, but not limited to, all acquisitions, testing and reverse-engineering of such products and the individuals involved in such efforts.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound. UPitt further objects to this interrogatory to the extent this information has been already produced, as evidenced by previous court filings.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian engaged in licensing discussions with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431. UPitt first became aware of Varian's infringing products prior to the filing of this lawsuit. UPitt has reviewed publicly available information on Varian's products including information on Varian's website, its brochures and other literature, such as, for example, the items found in Bates Nos. PITT00001882-PITT00001924 and PIT00002066-PITT00002160. UPitt further directs Defendant to UPitt's Local Patent Rule 3.2 Disclosure of Asserted Claims and Infringement Contentions.

INTERROGATORY 5:

Describe a person of ordinary skill in the art with respect to each of the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case, and objects pursuant to Local Rule 2.5. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, UPitt responds that further discovery must be conducted in order to respond to this interrogatory. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

INTERROGATORY 6:

With respect to each asserted claim of the Patents-in-Suit, state the dates on which you

contend that Varian (a) was aware of the claim and (b) had notice of infringement of the claim. In addition, state all facts supporting your contention (if any) that Varian was aware of or had notice of Infringement of the claim prior to the filing of the Complaint, Identify all persons with knowledge of those facts, and Identify all documents supporting your contention.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound. UPitt further objects to this interrogatory to the extent it calls for information that is in the custody and control of Varian.

Subject to, and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian had knowledge of the development of the technology that became claimed in the patents-in-suit at the time UPitt was seeking a collaboration agreement from Varian. UPitt presumes that Varian had notice of the claims of the patents-in-suit and its infringement of the patents-in-suit when the patents issued, and Varian began incorporating the technology into its machines and practicing the inventions claimed in the patents-in-suit. Certainly, Varian was aware of the claims and its infringement of the patents-in-suit when it was discussing a license of the patents-in-suit from UPitt in 2002, 2005 and 2006. UPitt further directs Defendant to Varian's response to UPitt's interrogatory no. 4, and to the documents cited therein.

INTERROGATORY 7:

State the basis for your contention, if any, that Any Varian Product Infringes Any asserted claim of the Patents-in-Suit under the Doctrine of Equivalents, and state all facts,

Identify all Persons with knowledge of those facts, and Identify all Documents, things, and testimony supporting your contention.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound.

Subject to and without waiving its objections, UPitt responds that it believes each of the Asserted Claims of the Patents-in-Suit are infringed literally. To the extent that Defendant alleges that one or more elements of any claim is not present in an accused instrumentality, UPitt reserves the right establish infringement under the doctrine of equivalents. UPitt further directs Defendant to UPitt's Local Patent Rule 3.2 Disclosure of Asserted Claims and Infringement Contentions.

INTERROGATORY 8:

State all facts and Identify all Documents, things, and testimony that you contend constitute objective evidence of the non-obviousness of each asserted claim of the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on

the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound.

Subject to and without waiving its objections, UPitt responds that Varian engaged with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431. UPitt further directs Defendant to documents produced by UPitt from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00000516-PITT00000641, PITT00001282-PITT00001288, PITT00001876-PITT00001878, PITT00001882-PITT00001902, PITT00001922-PITT00001924, PITT00002077-PITT00002115, PITT00001676-PITT00001679, PITT00001681-PITT00001688, and PITT00001735-PITT00001736.

INTERROGATORY 9:

State all facts and Identify all Documents and things Concerning Any Communications Concerning the Patents-in-Suit between Plaintiff and University of Pittsburgh Medical Center, including but not limited to the identity of people involved and the circumstances surrounding the Communications.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is on-going in this case, and that it seeks information not in the custody or control of UPitt. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, and ambiguous.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that prior to July 1, 1998, the University of Pittsburgh Medical Center and the University of Pittsburgh were part of the same organization and after July 1, 1998 were separate non-profit entities. Two of the inventors of the patents-in-suit, namely Dr. Greenberger and Dr. Kalend, were employees of both the University of Pittsburgh Medical Center (the clinical entity) and the University of Pittsburgh (the research and education entity). Plaintiff cannot answer this question because essentially all communications Dr. Greenberger and Dr. Kalend had, even with each other, related to the patents-in-suit, might conceivably be characterized as a communication between University of Pittsburgh and University of Pittsburgh Medical Center since both doctors were employees of both entities. Further, after a diligent search, UPitt has produced documents already in this case evidencing communication between UPitt and University of Pittsburgh Medical Center, and will supplement its production with any additional relevant and non-privileged documents or information responsive if it discovers additional documents.

INTERROGATORY 10:

State all facts and Identify all Documents and things Concerning the Due Diligence conducted by Plaintiff prior to and negotiations Plaintiff had with Any third party leading to the acquisition of the Patents-In-Suits and Any related patents and applications, including but not limited to Any Communications Concerning the acquisition of the Patents-in-Suit, any evaluation of the value of the Patents-in-Suit, and the final price and other benefits provided by Plaintiff to acquire the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other

applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that no due diligence was conducted by Plaintiff prior to nor were any negotiations conducted between Plaintiff and any third party leading to or for the purpose of acquiring the patents-in-suit.

DATED: June 25, 2007



Daniel Johnson, Jr. (admitted *pro hac vice*)
Rita E. Tautkus (admitted *pro hac vice*)
Allison K. Young (admitted *pro hac vice*)
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Square, Suite 700
3000 El Camino Real
Palo Alto, CA 94306
(650) 843-4000
(650) 843-4001 (facsimile)
djohnson@morganlewis.com
rtautkus@morganlewis.com
allison.young@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
MORGAN, LEWIS & BOCKIUS LLP
One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com

Attorneys for Plaintiff University of Pittsburgh

JUN-25-2007 MON 05:08 PM TECHNOLOGY MANAGEMENT

FAX NO. 412 648 8525

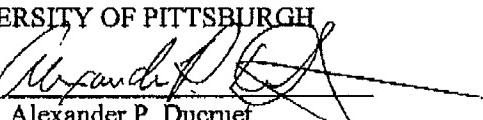
P. 03

VERIFICATION

I, Alexander P. Ducruet, am a Technology Licensing Manager in the Office of Technology Management at Plaintiff University of Pittsburgh, and am authorized to make this verification on its behalf. I have read UNIVERSITY OF PITTSBURGH'S RESPONSES AND OBJECTIONS TO VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES and know the contents thereof. I am informed and believe that the responses contained therein are true and correct and, on that basis, I verify that they are true and correct. I verify under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

UNIVERSITY OF PITTSBURGH

By:



Alexander P. Ducruet
Technology Licensing Manager
University of Pittsburgh

Dated: June 25, 2007

CERTIFICATE OF SERVICE

I am employed in the City of San Francisco, County of San Francisco, State of California. I am over the age of 18 years and not a party to the within action. My business address is One Market, Spear Street Tower, San Francisco, California 94105. On June 25, 2007, I caused the original of the attached document(s) described as follows:

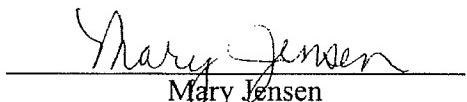
UNIVERSITY OF PITTSBURGH'S RESPONSES AND OBJECTIONS TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES

to be served on:

Matthew H. Poppe, Esq.
Orrick, Herrington & Sutcliffe LLP
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
(650) 614-7401 (facsimile)
[wantonhy@orrick.com](mailto:wanthony@orrick.com)
mpoppe@orrick.com

X (BY FIRST CLASS MAIL) I caused each such envelope to the addressee(s) noted above, with postage thereon fully prepaid, to be placed in the United States mail in San Francisco, California. I am readily familiar with the practice of Morgan, Lewis & Bockius LLP for collection and processing of correspondence for mailing, said practice being that in the ordinary course of business mail is deposited in the United States Postal Service the same date as it is placed for collection.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed at San Francisco, California, on June 25, 2007.



Mary Jensen

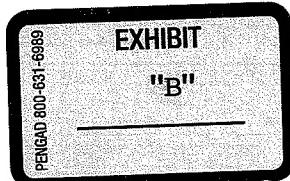
**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

UNIVERSITY OF PITTSBURGH,	)	CIVIL ACTION No. 2:07-cv-00491-AJS
Plaintiff,	)	Judge Arthur J. Schwab
v.	)	UNIVERSITY OF PITTSBURGH'S SUPPLEMENTAL RESPONSES AND OBJECTIONS TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES
VARIAN MEDICAL SYSTEMS, INC.,)	
Defendant.)	

Pursuant to Rule 33 of the Federal Rules of Civil Procedure, Plaintiff University of Pittsburgh hereby supplements its Answers and Objections to Defendant Varian Medical Systems, Inc.'s First Set of Interrogatories.

GENERAL OBJECTIONS

1. University of Pittsburgh (hereafter "UPitt") objects to the definitions, instructions, and interrogatories of Varian Medical Systems, Inc. (hereafter "Varian") to the extent they seek to impose obligations on UPitt in excess of those stated in the Federal Rules of Civil Procedure. Subject to and without waiving this objection, UPitt will respond to the interrogatories only as required by those rules.
2. UPitt objects to Varian's interrogatories to the extent that they are overly broad, vague, ambiguous and unduly burdensome in that they do not clearly define what information is requested or because they are not reasonably limited in scope and time.
3. UPitt objects to Varian's interrogatories to the extent that they seek information not relevant to the subject matter involved in the pending action, or information not reasonably calculated to lead to the discovery of admissible evidence.



4. UPitt objects to Varian's interrogatories to the extent that they seek information not available to UPitt at this time. The responses are based on information currently available to UPitt, subject to any applicable objection. The responses are to the best of UPitt's present ability and information. UPitt reserves the right to supplement any response at a later date, even after completion of discovery, as well as the right to introduce evidence at the time of trial based upon information and/or documents subsequently located, developed, or discovered which evidence may supplement, amplify, modify, or conflict with these responses.

**SUPPLEMENTAL ANSWERS AND OBJECTIONS TO FIRST SET OF
INTERROGATORIES**

INTERROGATORY 1:

State all facts and identify all documents, communications and things concerning any actual or contemplated transfer of ownership or transfer or license of rights relating to any patents-in-suit, including any actual or contemplated contracts, transfer agreements, option agreement, licenses or assignments or communications relating to the same, between Plaintiff and any third party.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that

it is premature as discovery is on-going in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that there has been no actual transfer of ownership or transfer or license of rights relating to any patents-in-suit. UPitt and Defendant Varian engaged in two rounds of discussions related to Varian's contemplated licensing of the patents-in-suit. The first round occurred prior to May 30, 2002 and continued through September 9, 2002, as evidenced by documents already produced in this case (see, e.g., PITT00002230-PITT00002244). The second round of discussions occurred between November 16, 2005 and December 13, 2006, as evidenced by documents already produced in this case (see, e.g., PITT00001625-PITT00001672, PITT00002018-PITT00002054, and PITT00002161-PITT00002218). While contemplated, neither set of discussions resulted in Varian actually taking a license of the patents-in-suit.

UPitt further responds that it engaged in a sponsored research relationship with Elekta on November 11, 1998. The sponsored research agreement contained an option for Elekta to take an exclusive license in the patents-in-suit, however, that option was never exercised. UPitt will produce additional relevant non-privileged documents responsive to this request.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that

it is premature as discovery is on-going in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that there has been no actual transfer of ownership or transfer or license of rights relating to any patents-in-suit. UPitt and Defendant Varian engaged in two rounds of discussions related to Varian's contemplated licensing of the patents-in-suit. The first round occurred prior to May 30, 2002 and continued through September 9, 2002, as evidenced by documents already produced in this case (see, e.g., PITT00002230-PITT00002244). The second round of discussions occurred between November 16, 2005 and December 13, 2006, as evidenced by documents already produced in this case (see, e.g., PITT00001625-PITT00001672, PITT00002018-PITT00002054, and PITT00002161-PITT00002218). While contemplated, neither set of discussions resulted in Varian actually taking a license of the patents-in-suit.

UPitt further responds that it engaged in a sponsored research relationship with Elekta on November 11, 1998. The sponsored research agreement contained an option for Elekta to take an exclusive license in the patents-in-suit, however, that option was never exercised. UPitt will produce additional relevant non-privileged documents responsive to this request.

On various dates in August 1996, Dr. Andre M. Kalend, Dr. Joel Greenberger, Dr. Karun B. Shimoga, Mr. Charalambos N. Athanassiou and Dr. Takeo Kanade executed an assignment of their interests in the US Patent Application entitled "Apparatus Responsive to Movement of a Patient During Treatment/Diagnosis" (PITT 00006892-6893).

On various dates in September and October 1996, Dr. Andre M. Kalend, Dr. Joel Greenberger, Dr. Karun B. Shimoga, Mr. Charalambos N. Athanassiou and Dr. Takeo Kanade executed an assignment of their interests in the US Patent Application entitled "Apparatus For Matching X-Ray Images With Reference Images" (PITT00006157-6159).

In 1997, UPitt had limited discussions with Siemens concerning a proposal to fund research in dynamic/conformal radiotherapy. On or about November 3, 1997, Siemens notified UPitt that it would not fund such research (PITT00004612).

On or about May 18, 2001, Elekta sent a letter to UPitt that notified UPitt of its request to terminate the 1998 Joint Sponsored Research Agreement (PITT00004971-4972). On or about June 1, 2001, UPitt provided its written response that summarized its position and history with respect to the Sponsored Research Agreement (PITT00007371-7377). Elekta did not exercise the option to license the patents-in-suit under the Sponsored Research Agreement.

In approximately October 2005, a former NOMOS employee approached UPitt regarding licensing the patents-in-suit by his venture capital group. Based on a limited set of discussions, no steps were taken to transfer any rights to the patents-in-suit. Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 2:

For each asserted claim of the Patent-in-Suit, describe the circumstances surrounding the invention of the claim, including but not limited to, the precise date of conception, the persons involved, the Date of actual reduction to practice whether before or after Any Filing Date, the identity of Any corroborating witness, the steps constituting diligence from conception to actual or constructive reduction to practice, and Identify Any resulting devices and Identify Any

Documents supporting these facts.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds, based on information located after a reasonably diligent search, that the answer to this interrogatory may be derived or ascertained from documents produced by UPitt including: Bates Nos. PITT00001570-PITT00001572, PITT00001680, PITT00001693-PITT00001705, PITT00001738-PITT00001742, PITT00001757-PITT00001875, PITT00001879-PITT00001881, PITT00001985, and PITT00001998-PITT00002008. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to

this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds, based on information located after a reasonably diligent search, that the answer to this interrogatory may be derived or ascertained from documents produced by UPitt including: Bates Nos. PITT00001570-PITT00001572, PITT00001680, PITT00001693-PITT00001705, PITT00001738-PITT00001742, PITT00001757-PITT00001875, PITT00001879-PITT00001881, PITT00001985, and PITT00001998-PITT00002008. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

UPitt further responds that the invention claimed in U.S. Patent No. 5,784,431 ("the '431 patent") was conceived at least as early as July 1, 1993. There were multiple meetings between the inventors of the '431 patent that started as early as 1994. (*See, e.g.*, PITT00001870). The invention was reduced to practice at least as early as September 26, 1995. Corroborating witnesses as to the conception of the claimed invention include Kenneth McCarty. Drs. Andre Kalend and Karun Shimoga and Mr. Charalambos Athanassiou were involved in the reduction to practice. Multiple experimental set ups were created that contained aspects of the inventions.

For example, in the mid-1990s an experimental set up was constructed at Carnegie Mellon University, and later at the University of Pittsburgh Medical Center, that included multiple computers connected together. Test images were scanned from film images, converted to digital form and stored on the computers. The test images included images taken before treatment, after treatment, and during treatment. In addition, in connection with a sponsored research relationship with Elekta Oncology Systems, Inc., multiple systems were created that contained

aspects of the inventions. Documents related to the experimental set ups and/or resulting devices include, for example, the schematics shown in Bates Nos. PITT00001570-PITT00001571. Documents that relate to the development of the inventions include Bates Nos. KS0000041-KS0000064. UPitt further directs Defendant to documents produced by UPitt from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00002247-PITT00002252, PITT00002253, PITT00003488-PITT00003490, KAN0002-KAN0010, and KAN0014-KAN0068.

The invention claimed in U.S. Patent No. 5,727,554 ("the '554 patent") was conceived at least as early as July 1, 1993. There were multiple meetings between the inventors of the '554 patent that started as early as 1994. (*See, e.g.*, PITT00001870). The invention was reduced to practice at least as early as September 26, 1995. Corroborating witnesses as to the conception of the claimed invention include Kenneth McCarty. Drs. Andre Kalend and Karun Shimoga and Mr. Charalambos Athanassiou were involved in the reduction to practice. Multiple experimental set ups were created that contained aspects of the inventions. For example, in the mid-1990s an experimental set up was built at Carnegie Mellon University, and later at the University of Pittsburgh Medical Center, that included a table and writing desk used as a treatment couch, and mannequins used as a patient. Several markers were attached to the mannequin – both light reflective markers and non-reflective markers. Sensors were attached to the wall and a camera on the false ceiling. In addition, in connection with a sponsored research relationship with Elekta Oncology Systems, Inc., multiple systems were created that contained aspects of the inventions. Documents related to the experimental set ups and/or resulting devices include, for example, the schematics shown in Bates Nos. PITT00001570-PITT00001571. Documents that relate to the development of the inventions include Bates Nos. KS0000041-KS0000064. UPitt

further directs Defendant to documents produced by UPitt from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00002247-PITT00002252, PITT00002253, KAN0002-KAN0010, and KAN0014-KAN0068.

Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 4:

For each Accused Varian Product Plaintiff believes as Infringing Any asserted claims of the Patents-in-Suit, state all facts concerning Plaintiff forming its belief that that such product Infringes, including, but not limited to, the Date that Plaintiff first learned of the product, the Date Plaintiff first came to believe the product was Infringing, the persons, documents and things involved in informing Plaintiff about the product and informing Plaintiff's belief that the product is Infringing, and all efforts that Plaintiff undertook to substantiate its belief that the product is Infringing, including, but not limited to, all acquisitions, testing and reverse-engineering of such products and the individuals involved in such efforts.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound. UPitt

further objects to this interrogatory to the extent this information has been already produced, as evidenced by previous court filings.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian engaged in licensing discussions with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431. UPitt first became aware of Varian's infringing products prior to the filing of this lawsuit. UPitt has reviewed publicly available information on Varian's products including information on Varian's website, its brochures and other literature, such as, for example, the items found in Bates Nos. PITT00001882-PITT00001924 and PIT00002066-PITT00002160. UPitt further directs Defendant to UPitt's Local Patent Rule 3.2 Disclosure of Asserted Claims and Infringement Contentions.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound. UPitt further objects to this interrogatory to the extent this information has been already produced, as evidenced by previous court filings.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian engaged in licensing discussions with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431.

UPitt first became aware of Varian's infringing products prior to the filing of this lawsuit. UPitt has reviewed publicly available information on Varian's products including information on Varian's website, its brochures and other literature, such as, for example, the items found in Bates Nos. PITT00001882-PITT00001924 and PIT00002066-PITT00002160. UPitt further directs Defendant to UPitt's Local Patent Rule 3.2 Disclosure of Asserted Claims and Infringement Contentions.

UPitt further responds that UPitt reviewed, or had reviewed, publicly available information describing Varian's products on multiple occasions.

U.S. Patent 5,784,431

For example, on or before September 2006, UPitt had reviewed the product manuals of the Varian Trilogy system with respect to U.S. Patent No. 5,784,431. Further, on or before January 2007, UPitt had reviewed publicly available information on Varian's Trilogy System, PortalVision, and On-Board Imager with respect to the '431 patent.

U.S. Patent 5,727,554

For example, on or before September 2006, UPitt had reviewed the product manuals of the Varian Trilogy system with respect to U.S. Patent No. 5,727,554. Further, on or before January 2007, UPitt had reviewed publicly available information on Varian's Trilogy system and Real-time Position Management system with respect to the '554 patent.

Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 5:

Describe a person of ordinary skill in the art with respect to each of the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case, and objects pursuant to Local Rule 2.5. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, UPitt responds that further discovery must be conducted in order to respond to this interrogatory. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case, and objects pursuant to Local Rule 2.5. UPitt further objects to this interrogatory on the grounds that the information it seeks is neither relevant nor likely to lead to the discovery of admissible evidence.

Subject to and without waiving its objections, UPitt responds that further discovery must be conducted in order to respond to this interrogatory. UPitt's investigation is continuing for UPitt's patents-in-suit and UPitt reserves the right to further supplement as needed.

UPitt further responds that a person of ordinary skill in the art with respect to U.S. Patent No. 5,727,554 is someone who is a medical physicist with a M.S. degree in physics or engineering and has five years experience, including experience with programming and imaging. Alternatively, one of ordinary skill in the art could be a radiation oncologist with approximately five years experience and a programmer with five years experience, including experience in imaging analysis.

With respect to U.S. Patent No. 5,784,431, a person of ordinary skill in the art would have a Ph.D. in medical physics with five years experience, including experience with image analysis. Alternatively, one of ordinary skill in the art could be a radiation oncologist and a computer scientist with at least a masters degree.

Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 6:

With respect to each asserted claim of the Patents-in-Suit, state the dates on which you contend that Varian (a) was aware of the claim and (b) had notice of infringement of the claim. In addition, state all facts supporting your contention (if any) that Varian was aware of or had notice of Infringement of the claim prior to the filing of the Complaint, Identify all persons with knowledge of those facts, and Identify all documents supporting your contention.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory as overly broad, vague, ambiguous and compound. UPitt further objects to this interrogatory to the extent it calls for information that is in the custody and control of Varian.

Subject to, and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian had knowledge of the development of the technology that became claimed in the patents-in-suit at the time UPitt was seeking a collaboration agreement from Varian. UPitt presumes that Varian had notice of the claims of the patents-in-suit and its infringement of the patents-in-suit when the patents issued, and Varian began incorporating the technology into its machines and practicing the inventions claimed in the patents-in-suit. Certainly, Varian was aware of the claims and its infringement of the patents-in-suit when it was discussing a license of the patents-in-suit from UPitt in 2002, 2005 and 2006. UPitt further directs Defendant to Varian's response to UPitt's interrogatory no. 4, and to the documents cited therein.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege and attorney work product doctrine or any other applicable privilege or protection. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory

as overly broad, vague, ambiguous and compound. UPitt further objects to this interrogatory to the extent it calls for information that is in the custody and control of Varian.

Subject to, and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that Varian had knowledge of the development of the technology that became claimed in the patents-in-suit at the time UPitt was seeking a collaboration agreement from Varian. UPitt presumes that Varian had notice of the claims of the patents-in-suit and its infringement of the patents-in-suit when the patents issued, and Varian began incorporating the technology into its machines and practicing the inventions claimed in the patents-in-suit. Certainly, Varian was aware of the claims and its infringement of the patents-in-suit when it was discussing a license of the patents-in-suit from UPitt in 2002, 2005 and 2006. UPitt further directs Defendant to Varian's response to UPitt's interrogatory no. 4, and to the documents cited therein.

UPitt further responds that Varian was aware of the claims of U.S. Patent No. 5,727,554 as early as February 15, 2000 when the '554 patent was cited in a Patent Cooperation Treaty notification received by Varian. Varian was also aware of the claims of U.S. Patent No. 5,784,431 as early as February 26, 2002 when Reed McManigle of the Office of Technology Management of the University of Pittsburgh e-mailed Richard Morse of Varian regarding, inter alia, U.S. Patent No. 5,784,431. (*See, e.g.*, VAR00313575). On October 28, 2002, the '431 patent was cited in an Information Disclosure Statement to the U.S. Patent and Trademark Office in connection with a patent application submitted by Varian. Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 8:

State all facts and Identify all Documents, things, and testimony that you contend constitute objective evidence of the non-obviousness of each asserted claim of the Patents-in-Suit.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound.

Subject to and without waiving its objections, UPitt responds that Varian engaged with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431. UPitt further directs Defendant to documents produced by UPitt from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00000516-PITT00000641, PITT00001282-PITT00001288, PITT00001876-PITT00001878, PITT00001882-PITT00001902, PITT00001922-PITT00001924, PITT00002077-PITT00002115, PITT00001676-PITT00001679, PITT00001681-PITT00001688, and PITT00001735-PITT00001736.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other

applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is continuing in this case. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, ambiguous, and compound.

Subject to and without waiving its objections, UPitt responds that Varian engaged with UPitt in 2002 and 2005 to discuss licensing U.S. Patent Nos. 5,727,554 and 5,784,431. UPitt further directs Defendant to documents produced by UPitt from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00000516-PITT00000641, PITT00001282-PITT00001288, PITT00001876-PITT00001878, PITT00001882-PITT00001902, PITT00001922-PITT00001924, PITT00002077-PITT00002115, PITT00001676-PITT00001679, PITT00001681-PITT00001688, and PITT00001735-PITT00001736.

UPitt further responds that the United States Patent and Trademark Office has issued U.S. Patent Nos. 5,727,554 and 4,784,431 after conducting an examination of their patent applications for patentability and it concluded that the issued claims are not obvious. UPitt further directs Defendant to documents produced by UPitt and Varian from which further information responsive to this interrogatory may be derived or ascertained, including: Bates Nos. PITT00005216-PITT00005222, PITT00007781, VAR00051015-VAR00051104, VAR00051467-VAR00051536, and VAR00051990-VAR00052089. Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

INTERROGATORY 9:

State all facts and Identify all Documents and things Concerning Any Communications Concerning the Patents-in-Suit between Plaintiff and University of Pittsburgh Medical Center,

including but not limited to the identity of people involved and the circumstances surrounding the Communications.

PLAINTIFF'S RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is on-going in this case, and that it seeks information not in the custody or control of UPitt. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, and ambiguous.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that prior to July 1, 1998, the University of Pittsburgh Medical Center and the University of Pittsburgh were part of the same organization and after July 1, 1998 were separate non-profit entities. Two of the inventors of the patents-in-suit, namely Dr. Greenberger and Dr. Kalend, were employees of both the University of Pittsburgh Medical Center (the clinical entity) and the University of Pittsburgh (the research and education entity). Plaintiff cannot answer this question because essentially all communications ~~Dr. Greenberger and Dr. Kalend had, even with each other, related to the patents-in-suit, might~~ conceivably be characterized as a communication between University of Pittsburgh and University of Pittsburgh Medical Center since both doctors were employees of both entities. Further, after a diligent search, UPitt has produced documents already in this case evidencing communication between UPitt and University of Pittsburgh Medical Center, and will supplement

its production with any additional relevant and non-privileged documents or information responsive if it discovers additional documents.

PLAINTIFF'S SUPPLEMENTAL RESPONSE:

UPitt objects to this interrogatory to the extent it seeks information protected from discovery by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection from discovery. UPitt further objects to this interrogatory on the grounds that it is premature as discovery is on-going in this case, and that it seeks information not in the custody or control of UPitt. UPitt further objects to this interrogatory on the grounds that it is overly broad, vague, and ambiguous.

Subject to and without waiving its objections, and to the extent that UPitt can determine what information Varian is seeking, UPitt responds that prior to July 1, 1998, the University of Pittsburgh Medical Center and the University of Pittsburgh were part of the same organization and after July 1, 1998 were separate non-profit entities. Two of the inventors of the patents-in-suit, namely Dr. Greenberger and Dr. Kalend, were employees of both the University of Pittsburgh Medical Center (the clinical entity) and the University of Pittsburgh (the research and education entity). Plaintiff cannot answer this question because essentially all communications ~~Dr. Greenberger and Dr. Kalend had, even with each other, related to the patents-in-suit, might~~ conceivably be characterized as a communication between University of Pittsburgh and University of Pittsburgh Medical Center since both doctors were employees of both entities. Further, after a diligent search, UPitt has produced documents already in this case evidencing communication between UPitt and University of Pittsburgh Medical Center, and will supplement

its production with any additional relevant and non-privileged documents or information responsive if it discovers additional documents.

UPitt identifies the following non-privileged written communications exchanged between the University of Pittsburgh and the University of Pittsburgh Medical Center (or its affiliates) concerning the patents-in-suit: PITT00002297-2298, PITT00003497-3498. Further, on or about September 14, 2005, a memo proposing a meeting was sent to Dr. Greenberger, Dr. Shogan, Dr. Heron, Dr. Huq, Chuck Bogosta, Robin Green, Joe Nicholas and Robert Riker to discuss the patents-in-suit. On or about October 14, 2005, there were communications between Dr. Joel Greenberger and Robert Riker regarding the patents-in-suit. After a reasonable and diligent search, UPitt has been unable to identify additional non-privileged responsive written communications in its possession, custody or control, exchanged between the University of Pittsburgh (or its affiliates) and the University of Pittsburgh Medical Center (or its affiliates) that specifically concern the two patents-in-suit. Should any responsive non-privileged documents be identified, UPitt will produce them. Discovery is on-going and UPitt reserves the right to amend, revise, or modify its response.

DATED: September 10, 2007



Daniel Johnson, Jr. (admitted *pro hac vice*)

Rita E. Tautkus (admitted *pro hac vice*)

Darcy A. Paul (admitted *pro hac vice*)

MORGAN, LEWIS & BOCKIUS LLP

2 Palo Alto Square, Suite 700

3000 El Camino Real

Palo Alto, CA 94306

(650) 843-4000

(650) 843-4001 (facsimile)

djohnson@morganlewis.com

rtautkus@morganlewis.com

dpaul@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
MORGAN, LEWIS & BOCKIUS LLP
One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com

Attorneys for Plaintiff University of Pittsburgh

SEP-10-2007 MON 05:19 PM TECHNOLOGY MANAGEMENT

FAX NO. 412 648 8525

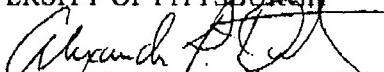
P. 03

VERIFICATION

I, Alexander P. Ducruet, am a Technology Licensing Manager in the Office of Technology Management at Plaintiff University of Pittsburgh, and am authorized to make this verification on its behalf. I have read UNIVERSITY OF PITTSBURGH'S SUPPLEMENTAL RESPONSES AND OBJECTIONS TO VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES and know the contents thereof. I am informed and believe that the responses contained therein are true and correct and, on that basis, I verify that they are true and correct. I verify under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

UNIVERSITY OF PITTSBURGH

By:



Alexander P. Ducruet
Technology Licensing Manager
University of Pittsburgh

Dated: 9/10/2007

CERTIFICATE OF SERVICE

I am employed in the City of Palo Alto, County of Santa Clara, State of California. I am over the age of 18 years and not a party to the within action. My business address is 2 Palo Alto Square, 3000 El Camino Real, Suite 700, Palo Alto, CA 94306-2122. On September 10, 2007, I caused the original of the attached document(s) described as follows:

UNIVERSITY OF PITTSBURGH'S SUPPLEMENTAL RESPONSES AND OBJECTIONS TO DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S FIRST SET OF INTERROGATORIES

to be served on:

Matthew H. Poppe, Esq.
Orrick, Herrington & Sutcliffe LLP
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
(650) 614-7401 (facsimile)
mpoppe@orrick.com

X (BY PERSONAL SERVICE) The person whose name is noted below caused to be delivered by hand each such envelope to the addressee(s) noted above.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed at Palo Alto, California, on September 10, 2007.



Marilyn J. Boensch

**Issued by the
UNITED STATES DISTRICT COURT**

WESTERN

DISTRICT OF

PENNSYLVANIA

University of Pittsburgh

v.

SUBPOENA IN A CIVIL CASECase Number:¹ 07-CV-0491 (AJS)

Varian Medical Systems, Inc.

TO: Carnegie Mellon University
5000 Forbes Ave
Pittsburgh, PA 15213

YOU ARE COMMANDED to appear in the United States District court at the place, date, and time specified below to testify in the above case.

PLACE OF TESTIMONY	COURTROOM
	DATE AND TIME

YOU ARE COMMANDED to appear at the place, date, and time specified below to testify at the taking of a deposition in the above case.

PLACE OF DEPOSITION	DATE AND TIME

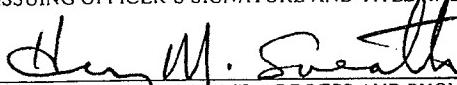
YOU ARE COMMANDED to produce and permit inspection and copying of the following documents or objects at the place, date, and time specified below (list documents or objects): SEE ATTACHED **EXHIBIT A**.

PLACE	DATE AND TIME
Picadio Sneath Miller & Norton, P.C.; 4710 U.S. Steel Tower; 600 Grant Street; Pittsburgh, PA 15219-2702 or TBD	June 27, 2007

YOU ARE COMMANDED to permit inspection of the following premises at the date and time specified below.

PREMISES	DATE AND TIME

Any organization not a party to this suit that is subpoenaed for the taking of a deposition shall designate one or more officers, directors, or managing agents, or other persons who consent to testify on its behalf, and may set forth, for each person designated, the matters on which the person will testify. Federal Rules of Civil Procedure, 30(b)(6).

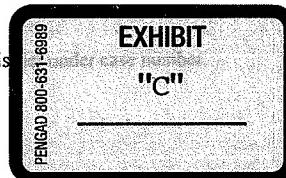
ISSUING OFFICER'S SIGNATURE AND TITLE (INDICATE IF ATTORNEY FOR PLAINTIFF OR DEFENDANT)	DATE
	June 13, 2007

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER

Henry Sneath, Esq., Picadio Sneath Miller & Norton, P.C.
4710 U.S. Steel Tower; 600 Grant Street; Pittsburgh, PA 15219-2702
(412) 288 - 4000

(See Rule 45, Federal Rules of Civil Procedure, Parts C & D on next page)

¹If action is pending in district other than district of issuance, state dis
OHS East:160238712.1



PROOF OF SERVICE	
DATE	TIME
SERVED <u>6.14.2007</u>	<u>9:30 am</u>
SERVED ON (PRINT NAME) <u>Jim Mercatene (Carnegie Mellon)</u>	MANNER OF SERVICE <u>direct personal service</u>
SERVED BY (PRINT NAME) <u>Mandy Lynn Jericho</u>	TITLE <u>Process Server</u>
DECLARATION OF SERVER	

I declare under penalty of perjury under the laws of the United States of America that the foregoing information contained in the Proof of Service is true and correct.

Executed on 6.14.2007

Mandy Lynn Jericho
SIGNATURE OF SERVER
557 Conrad Ave.
ADDRESS OF SERVER
D. Charleroi, PA 15022

Rule 45, Federal Rules of Civil Procedure, Parts C & D:

(c) PROTECTION OF PERSONS SUBJECT TO SUBPOENAS.

(1) A party or an attorney responsible for the issuance and service of a subpoena shall take reasonable steps to avoid imposing undue burden or expense on a person subject to that subpoena. The court on behalf of which the subpoena was issued shall enforce this duty and impose upon the party or attorney in breach of this duty an appropriate sanction which may include, but is not limited to, lost earnings and reasonable attorney's fee.

(2) (A) A person commanded to produce and permit inspection and copying of designated books, papers, documents or tangible things, or inspection of premises need not appear in person at the place of production or inspection unless commanded to appear for deposition, hearing or trial.

(B) Subject to paragraph (d) (2) of this rule, a person commanded to produce and permit inspection and copying may, within 14 days after service of subpoena or before the time specified for compliance if such time is less than 14 days after service, serve upon the party or attorney designated in the subpoena written objection to inspection or copying of any or all of the designated materials or of the premises. If objection is made, the party serving the subpoena shall not be entitled to inspect and copy materials or inspect the premises except pursuant to an order of the court by which the subpoena was issued. If objection has been made, the party serving the subpoena may, upon notice to the person commanded to produce, move at any time for an order to compel the production. Such an order to comply production shall protect any person who is not a party or an officer of a party from significant expense resulting from the inspection and copying commanded.

(3) (A) On timely motion, the court by which a subpoena was issued shall quash or modify the subpoena if it

- (i) fails to allow reasonable time for compliance,
- (ii) requires a person who is not a party or an officer of a party to travel to a place more than 100 miles from the place where that person resides, is employed or regularly transacts business in person, except

that, subject to the provisions of clause (c) (3) (B) (iii) of this rule, such a person may in order to attend trial be commanded to travel from any such place within the state in which the trial is held, or

- (iii) requires disclosure of privileged or other protected matter and no exception or waiver applies, or
- (iv) subjects a person to undue burden.

(B) If a subpoena

- (i) requires disclosure of a trade secret or other confidential research, development, or commercial information, or
- (ii) requires disclosure of an unrestrained expert's opinion or information not describing specific events or occurrences in dispute and resulting from the expert's study made not at the request of any party, or
- (iii) requires a person who is not a party or an officer of a party to incur substantial expense to travel more than 100 miles to attend trial, the court may, to protect a person subject to or affected by the subpoena, quash or modify the subpoena, or, if the party in whose behalf the subpoena is issued shows a substantial need for the testimony or material that cannot be otherwise met without undue hardship and assures that the person to whom the subpoena is addressed will be reasonably compensated, the court may order appearance or production only upon specified conditions.

(d) DUTIES IN RESPONDING TO SUBPOENA.

(1) A person responding to a subpoena to produce documents shall produce them as they are kept in the usual course of business or shall organize and label them to correspond with the categories in the demand.

(2) When information subject to a subpoena is withheld on a claim that it is privileged or subject to protection as trial preparation materials, the claim shall be made expressly and shall be supported by a description of the nature of the documents, communications, or things not produced that is sufficient to enable the demanding party to contest the claim.

University of Pgh

Civil No. 07-cv-0491

(AJG)

v.
Varian Medical Systems, Inc

OHS East:160238712.1

EXHIBIT A TO SUBPOENA TO CARNEGIE MELLON UNIVERSITY

DEFINITIONS AND INSTRUCTIONS

A. "Documents" is used in its broadest sense and means the originals and any non-identical copies and drafts of any writings, as defined by Federal Rule of Evidence 1001 to mean anything consisting "of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation," and including, but not limited to, all contracts, policy statements, manuals, telephone messages, checks, correspondence, letters, telegrams, notes, mailgrams, minutes of any meetings, agendas, memoranda, interoffice communications, reports, studies, forecasts, working papers, charts, expense account reports, ledgers, journals, financial statements, statements of account, calendars, appointment books, diaries, drawings, diagrams, graphs, schematics, specifications, blueprints, layouts, mask sets, photographs, sound recordings, video recordings, computer documents, computer disks, materials on a computer hard drive, electronic mail, PDA records, records created or maintained in other electronic devices, or any other tangible things. The term "documents" also means originals, copies and drafts of all of the above upon which notations in writing, print, or otherwise have been made that do not appear on the originals.

B. "You" means Carnegie Mellon University and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, and all other persons and entities representing it or acting on its behalf.

C. "Communication" refers to any contact, oral or documentary or electronic, formal or informal, at any place or under any circumstances whatsoever whereby information of any nature is transmitted or transferred, including, without limitation, a single person seeing or hearing any information by any means.

D. "Relate" and any variant thereof, including "relating to" and "related to," when used in connection with any document, shall be understood to apply if the document directly or indirectly evidences, mentions, discusses, constitutes, concerns, supports, contradicts, refers to, or in any other way deals with the subject matter described in the request in which the term "relate" or any variant thereof appears.

E. "Concerning" means referring to, relating to, pertaining to, relevant to, material to, embodying, evidencing, affecting, comprising, discussing, dealing with, supporting, contradicting or otherwise considering in any manner whatsoever the subject matter of the inquiry.

F. "Any" and "all" refer to and include the other; the terms "and" and "or" shall each mean and include the other, and the singular form of any word and the plural form of the word shall each mean and include the other.

G. "Thing" means any physical object other than a "document."

H. "Including" means including, but not limited to.

I. "Patents-in-suit" refers to U.S. Patent Nos. 5,784,431 and 5,727,554, or either of them.

J. "Patents-in-suit and related applications" refers to the patents-in-suit, as well as all patents, patent applications, continuation applications, continuation-in-part applications, and divisional applications, whether published or unpublished, U.S. or foreign, that cite the patents-in-suit, incorporate them by reference or otherwise, claim priority from or are used as a basis for the priority date for these patent applications.

K. "Patented inventions" means the inventions described in the patents-in-suit and related applications.

L. "Named inventors" means Andre M. Kalend, Joel Greenberger, Karun B. Shimoga, Charalambos N. Athanassiou, and Takeo Kanade.

M. "Varian" means Varian Medical Systems, Inc. and its past or present predecessors, subsidiaries, divisions, and affiliates.

N. "Lawsuit" means *University of Pittsburgh v. Varian Medical Systems, Inc.*, Case Number 07-CV-0491 (AJS) (W.D. Pa.).

O. You should search for documents in all relevant departments or subgroups of Carnegie Mellon University including but not limited to the Robotics Institute, the Center for Medical Robotics & Computer Aided Surgery, the National Robotics Engineering Center, the Human Computer Interaction Institute, the Vision and Autonomous Systems Center, the Medical Robotics Technology Center, and the Institute for Software Research.

CATEGORIES OF DOCUMENTS TO BE PRODUCED

1. All documents related to the patents-in-suit and related applications.
2. All documents related to conception and reduction to practice of the patented inventions.
3. All documents related to products or prototypes that implemented or attempted to implement the patented inventions.
4. All publications on which any named inventor is listed as an author.
5. All documents related to research, studies or work of any sort conducted or supervised by the named inventors and related to image guided radiation therapy, portal image matching, respiratory gating, or any subject matter related to the patents-in-suit and related applications.
6. All documents related to agreements between you and any of the named inventors regarding the transfer or assignment of any ownership rights in patents, patent applications, and inventions generally, or in the patented inventions or patents-in-suit and related applications in particular.

7. All documents related to agreements between you and the University of Pittsburgh, the University of Pittsburgh Medical Center, or any other entity regarding research related to the patented inventions or the patents-in-suit and related applications.

8. All documents related to agreements between you and the University of Pittsburgh or the University of Pittsburgh Medical Center regarding the transfer, assignment, or licensing of any rights in patents, patent applications, or inventions.

9. All documents related to agreements between you and the University of Pittsburgh, the University of Pittsburgh Medical Center, or any other entity regarding the transfer, assignment, or licensing of any rights in the patented inventions or patents-in-suit and related applications.

10. All documents related to royalties, revenues, or other consideration paid or received by you from or to the University of Pittsburgh, the University of Pittsburgh Medical Center, any named inventor, or any other person or entity in connection with the transfer, assignment, or licensing of any rights in the patent inventions or patents-in-suit and related applications.

11. All documents related to your purchase or use of any Varian product.

12. All documents related to alleged infringement of the patents-in-suit by Varian or any other person or entity.

13. All documents related to the validity, invalidity, enforceability, or unenforceability of the patents-in-suit, including but not limited to any documents identified to you by any person or entity as constituting or describing any prior art for the patents-in-suit.

14. All documents related to the Lawsuit, including but not limited to all documents related to the decision to file the Lawsuit.

15. All documents related to any discussion of whether or not to sue Varian or any other person or entity for alleged infringement of the patents-in-suit at any time.

16. All documents related to licensing negotiations with Varian or any other

person or entity concerning the patents-in-suit.

17. All documents related to any valuation of the patents-in-suit or valuation of any license or any grant of rights under the patents-in-suit.

18. All documents related to an Abbreviated Proposal submitted by or on behalf of Varian, you, and the University of Pittsburgh Medical Center to the National Institute of Standards and Technology, Advanced Technology Program, on or about April 20, 1994, including but not limited to all documents related to any actual or proposed research, design, development, study, testing, or other work conducted by or on behalf of Varian, you, the University of Pittsburgh Medical Center, or the University of Pittsburgh in connection with, in anticipation of, or in preparation for the Abbreviated Proposal.

**Issued by the
UNITED STATES DISTRICT COURT**

WESTERN**DISTRICT OF****PENNSYLVANIA**

University of Pittsburgh

v.

SUBPOENA IN A CIVIL CASECase Number:¹ 07-CV-0491 (AJS)

Varian Medical Systems, Inc.

TO: Carnegie Mellon University
5000 Forbes Ave
Pittsburgh, PA 15213

REVISED

- YOU ARE COMMANDED to appear in the United States District court at the place, date, and time specified below to testify in the above case.

PLACE OF TESTIMONY	COURTROOM
	DATE AND TIME

- YOU ARE COMMANDED to appear at the place, date, and time specified below to testify at the taking of a deposition in the above case regarding the topics set forth in EXHIBIT A hereto.

PLACE OF DEPOSITION Picadio Sneath Miller & Norton, P.C.; 4710 U.S. Steel Tower; 600 Grant Street; Pittsburgh, PA 15219-2702	DATE AND TIME September 26, 2007 at 9:00 a.m.
--	--

- YOU ARE COMMANDED to produce and permit inspection and copying of the following documents or objects at the place, date, and time specified below (list documents or objects):..

PLACE	DATE AND TIME

- YOU ARE COMMANDED to permit inspection of the following premises at the date and time specified below.

PREMISES	DATE AND TIME

Any organization not a party to this suit that is subpoenaed for the taking of a deposition shall designate one or more officers, directors, or managing agents, or other persons who consent to testify on its behalf, and may set forth, for each person designated, the matters on which the person will testify. Federal Rules of Civil Procedure, 30(b)(6).

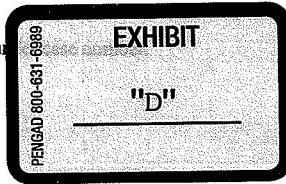
ISSUING OFFICER'S SIGNATURE AND TITLE (INDICATE IF ATTORNEY FOR PLAINTIFF OR DEFENDANT) <i>Henry M. Sneath /sme</i>	DATE
Attorney for Defendant	September 11, 2007

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER

Henry Sneath, Esq., Picadio Sneath Miller & Norton, P.C.
4710 U.S. Steel Tower; 600 Grant Street; Pittsburgh, PA 15219-2702
(412) 288 - 4000

(See Rule 45, Federal Rules of Civil Procedure, Parts C & D on next page)

¹If action is pending in district other than district of issuance, state district under
OHS West:260299890.1



PROOF OF SERVICE

DATE

TIME

SERVED

SERVED ON (PRINT NAME)

MANNER OF SERVICE

SERVED BY (PRINT NAME)

TITLE

DECLARATION OF SERVER

I declare under penalty of perjury under the laws of the United States of America that the foregoing information contained in the Proof of Service is true and correct.

Executed on _____

DATE

SIGNATURE OF SERVER

ADDRESS OF SERVER

Rule 45, Federal Rules of Civil Procedure, Parts C & D:

(c) PROTECTION OF PERSONS SUBJECT TO SUBPOENAS.

(1) A party or an attorney responsible for the issuance and service of a subpoena shall take reasonable steps to avoid imposing undue burden or expense on a person subject to that subpoena. The court on behalf of which the subpoena was issued shall enforce this duty and impose upon the party or attorney in breach of this duty an appropriate sanction which may include, but is not limited to, lost earnings and reasonable attorney's fee.

(2) (A) A person commanded to produce and permit inspection and copying of designated books, papers, documents or tangible things, or inspection of premises need not appear in person at the place of production or inspection unless commanded to appear for deposition, hearing or trial.

(B) Subject to paragraph (d) (2) of this rule, a person commanded to produce and permit inspection and copying may, within 14 days after service of subpoena or before the time specified for compliance if such time is less than 14 days after service, serve upon the party or attorney designated in the subpoena written objection to inspection or copying of any or all of the designated materials or of the premises. If objection is made, the party serving the subpoena shall not be entitled to inspect and copy materials or inspect the premises except pursuant to an order of the court by which the subpoena was issued. If objection has been made, the party serving the subpoena may, upon notice to the person commanded to produce, move at any time for an order to compel the production. Such an order to comply production shall protect any person who is not a party or an officer of a party from significant expense resulting from the inspection and copying commanded.

(3) (A) On timely motion, the court by which a subpoena was issued shall quash or modify the subpoena if it

(i) fails to allow reasonable time for compliance,
 (ii) requires a person who is not a party or an officer of a party to travel to a place more than 100 miles from the place where that person resides, is employed or regularly transacts business in person, except

that, subject to the provisions of clause (c) (3) (B) (iii) of this rule, such a person may in order to attend trial be commanded to travel from any such place within the state in which the trial is held, or

(iii) requires disclosure of privileged or other protected matter and no exception or waiver applies, or
 (iv) subjects a person to undue burden.

(B) If a subpoena

(i) requires disclosure of a trade secret or other confidential research, development, or commercial information, or

(ii) requires disclosure of an unretained expert's opinion or information not describing specific events or occurrences in dispute and resulting from the expert's study made not at the request of any party, or

(iii) requires a person who is not a party or an officer of a party to incur substantial expense to travel more than 100 miles to attend trial, the court may, to protect a person subject to or affected by the subpoena, quash or modify the subpoena, or, if the party in whose behalf the subpoena is issued shows a substantial need for the testimony or material that cannot be otherwise met without undue hardship and assures that the person to whom the subpoena is addressed will be reasonably compensated, the court may order appearance or production only upon specified conditions.

(d) DUTIES IN RESPONDING TO SUBPOENA.

(1) A person responding to a subpoena to produce documents shall produce them as they are kept in the usual course of business or shall organize and label them to correspond with the categories in the demand.

(2) When information subject to a subpoena is withheld on a claim that it is privileged or subject to protection as trial preparation materials, the claim shall be made expressly and shall be supported by a description of the nature of the documents, communications, or things not produced that is sufficient to enable the demanding party to contest the claim.

EXHIBIT A TO SUBPOENA TO CARNEGIE MELLON UNIVERSITY

DEFINITIONS AND INSTRUCTIONS

A. "Documents" is used in its broadest sense and means the originals and any non-identical copies and drafts of any writings, as defined by Federal Rule of Evidence 1001 to mean anything consisting "of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation," and including, but not limited to, all contracts, policy statements, manuals, telephone messages, checks, correspondence, letters, telegrams, notes, mailgrams, minutes of any meetings, agendas, memoranda, interoffice communications, reports, studies, forecasts, working papers, charts, expense account reports, ledgers, journals, financial statements, statements of account, calendars, appointment books, diaries, drawings, diagrams, graphs, schematics, specifications, blueprints, layouts, mask sets, photographs, sound recordings, video recordings, computer documents, computer disks, materials on a computer hard drive, electronic mail, PDA records, records created or maintained in other electronic devices, or any other tangible things. The term "documents" also means originals, copies and drafts of all of the above upon which notations in writing, print, or otherwise have been made that do not appear on the originals.

B. "CMU" means Carnegie Mellon University and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, colleges, schools, departments, institutes, and all other persons and entities representing it or acting on its behalf.

C. "Communication" refers to any contact, oral or documentary or electronic, formal or informal, at any place or under any circumstances whatsoever whereby information of any nature is transmitted or transferred, including, without limitation, a single person seeing or hearing any information by any means.

D. "Relate" and any variant thereof, including "relating to" and "related to," means referring to, relating to, pertaining to, relevant to, material to, embodying, evidencing, affecting, comprising, discussing, dealing with, supporting, contradicting or otherwise considering in any manner whatsoever the subject matter of the inquiry.

E. "Relate" and any variant thereof, including "relating to" and "related to," when used in connection with any document, shall be understood to apply if the document directly or indirectly evidences, mentions, discusses, constitutes, concerns, supports, contradicts, refers to, or in any other way deals with the subject matter described in the request in which the term "relate" or any variant thereof appears.

F. "Any" and "all" refer to and include the other; the terms "and" and "or" shall each mean and include the other, and the singular form of any word and the plural form of the word shall each mean and include the other.

G. "Thing" means any physical object other than a "document."

H. "Patents-in-suit" refers to U.S. Patent Nos. 5,784,431 and 5,727,554, or either of them.

I. "Patents-in-suit and related applications" refers to the patents-in-suit, as well as all patents, patent applications, continuation applications, continuation-in-part applications, and divisional applications, whether published or unpublished, U.S. or foreign, that cite the patents-in-suit, incorporate them by reference or otherwise, claim priority from or are used as a basis for the priority date for these patent applications.

J. "Patented inventions" means the inventions described in the patents-in-suit and related applications.

K. The "192 Patent" refers to U.S. Patent No. 5,823,192.

L. "Named inventors" means Andre M. Kalend, Joel Greenberger, Karun B. Shimoga, Charalambos N. Athanassiou, and Takeo Kanade.

M. "Varian" means Varian Medical Systems, Inc. and its past or present predecessors, subsidiaries, divisions, and affiliates.

N. "Lawsuit" means *University of Pittsburgh v. Varian Medical Systems, Inc.*, Case Number 07-CV-0491 (AJS) (W.D. Pa.).

DEPOSITION TOPICS

1. CMU's involvement in the conception or reduction to practice of the Patented Inventions or any research related to the Patented Inventions.
2. The involvement of any CMU employee or representative, including but not limited to Dr. Takeo Kanade, Dr. Karun Shimoga, and Charalambos Athanassiu, in the conception and reduction to practice of the Patented Inventions or any research related to the Patented Inventions.
3. All agreements relating to the conception or reduction to practice of the Patented Inventions or any research related to the Patented Inventions, including but not limited to agreements between CMU on the one hand and the University of Pittsburgh, the University of Pittsburgh Medical Center, or any of the Named Inventors on the other.
4. The agreement between CMU, the University of Pittsburgh, and Elekta Oncology Systems, Inc. dated October 29, 1998, including but not limited to its creation and termination, the parties' performance thereunder, and any related litigation.
5. Ownership of the Patented Inventions and/or the Patents-In-Suit and Related Applications and all property rights therein.
6. All agreements relating to Ownership of the Patented Inventions and/or the Patents-In-Suit and Related Applications or any property rights therein, including but not limited to agreements relating to the transfer or assignment of any such rights.
7. The Policy Guidelines on Intellectual Property Rights and Technology Transfer Procedures in Collaborative Projects of the University of Pittsburgh and Carnegie Mellon University, and any other policy or agreement related to the same or similar subject matter from 1994 to the present.

8. The assignments executed by the Named Inventors in connection with the Patents-In-Suit.

9. CMU's right to any amounts obtained by the University of Pittsburgh in connection with this Lawsuit.

10. The Named Inventors' respective rights to any amounts obtained by the University of Pittsburgh in connection with this Lawsuit.

11. All licenses related to the Patents-In-Suit or the '192 Patent, or to any related applications or inventions.

12. All royalties or other consideration paid or delivered in connection with any license related to the Patents-In-Suit or the '192 Patent, or to any related applications or inventions.

13. CMU's policies and practices from 1998 to the present related to the setting of royalty rates in patent licenses for patents owned in whole or in part by CMU.

14. All discussions related to any actual or potential license related to the Patents-In-Suit or the '192 Patent, or to any related applications or inventions.

15. CMU's valuation of the Patented Inventions, the Patents-In-Suit, the '192 Patent, or the invention(s) of the '192 Patent.

16. The disclosure of information to Varian related to the Patented Inventions or the Patents-In-Suit at any time prior to the filing of this Lawsuit.

17. All discussions relating to the Lawsuit between CMU on the one hand and the University of Pittsburgh, the University of Pittsburgh Medical Center, or any of the Named Inventors on the other hand.

18. All discussions relating to actual or potential infringement of the Patents-In-Suit by Varian or any other Person between CMU on the one hand and the University of Pittsburgh, the University of Pittsburgh Medical Center on the other hand, or any of the Named Inventors on the other hand.

19. The documents produced by CMU in response to the subpoena in this Lawsuit dated June 13, 2007, including but not limited to their authenticity and their manner of creation and retention.

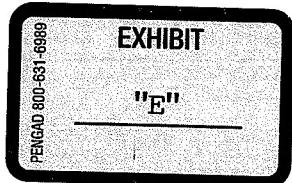
IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WESTERN PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)	
)	
Plaintiff,	)	Civil Action No. 2:07-cv-00491-AJS
v.)	
	)	Judge Arthur J. Schwab
VARIAN MEDICAL SYSTEMS, INC.)	
)	
Defendant.)	

DEFENDANT AND COUNTER-PLAINTIFF VARIAN MEDICAL SYSTEMS, INC.
REQUEST FOR PRODUCTION OF DOCUMENTS UNDER RULE 34

DEFINITIONS

- A. "Patents-In-Suit" refers to U.S. Patent Nos. 5,727,554 and 5,784,431.
- B. "University of Pittsburgh," "Plaintiff," "you," or "your" means Plaintiff and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, and all other persons and entities representing it or acting on its behalf.
- C. "Varian" means defendant Varian Medical Systems, Inc. its officers, directors, attorneys, and employees and Any other Persons representing it or acting on its behalf.
- D. The term "Plaintiff Patents" refers to the Patents-In-Suit, as well as all patents, patent applications, continuation applications, continuation in part applications, and divisional applications, whether published or unpublished, U.S. or foreign, that cite the Patents-In-Suit, incorporate them by reference or otherwise, claim priority from or are used as a basis for the priority date for these patent applications.
- E. "Plaintiff Products" means any product, apparatus, device, system, technology, prototype, method, or service (whether experimental or not, whether intended for sale or



commercialization or not, or whether reduced to practice or not) used, manufactured, tested, offered for sale, sold, or licensed by or for plaintiff.

F. "Accused Varian Products" refers to any and all products accused of infringement by Plaintiff. If this term is used in connection with a specific patent or patents, then it refers to any and all products accused by Plaintiff of infringing the specified patent or patents.

G. The term "Complaint" refers to the complaint for patent Infringement filed by Plaintiff against Varian on or about April 13, 2007.

H. "Due Diligence" means Any efforts, conversations, reviews of documentation or investigations of Any kind into the title, utility, validity, value, strategic value or commercial usefulness of patents, applications for patents, or other assets prior to the acquisition of those patents, applications, or assets.

I. "Date" means the day, month, and year, if ascertainable and if not, the best approximation thereof including in relation to other events.

J. "Filing Date" refers to the Date on which a patent application is filed in the U.S. Patent and Trademark Office.

K. "Infringe" or Any variant thereof, including but not limited to "Infringing" and "Infringement," refers to Any Infringement pursuant to 35 U.S.C. § 271 whether direct, indirect, contributory or by inducement.

L. The term "Prior Art" refers, by way of example and without limitation, to the subject matter described in 35 U.S.C. §§ 102 and 103, including without limitation, publications, physical products, devices, prototypes, uses, sales, and offers for sale and Any Document or thing evidencing Any of the foregoing.

M. "Any" shall be understood to include and encompass "All." As used herein, the singular shall always include the plural, and the present tense also shall include the past tense. The words "and" as well as "or" shall be construed disjunctively or conjunctively as necessary to

bring within the scope of the interrogatory all responses that might otherwise be construed to be outside its scope.

N. The term "Communication" means any contact, oral or documentary, formal or informal, at any time or place and under any circumstances whatsoever whereby information of any nature is transmitted or transferred, including but not limited to electronic communications.

O. "Identity" when used in connection with a natural person, means the name and last known home address and telephone number, employer name, work address and telephone number, cellular telephone number, and email address(es). To "identify" a natural person means to state the above information.

P. "Documents" means the originals and any non-identical copies and drafts of any writings, as defined by Federal Rule of Evidence 1001 to mean anything consisting "of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, Photostatting, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation," and including, but not limited to, all contracts, policy statements, manuals, telephone messages, checks, correspondence, letters, telegrams, notes, mailgrams, minutes of any meetings, agendas, memoranda, interoffice communications, reports, studies, forecasts, working papers, charts, expense account reports, ledgers, journals, financial statements, statements of account, calendars, appointment books, diaries, drawings, diagrams, graphs, schematics, specifications, blueprints, layouts, mask sets, photographs, sound recordings, video recordings, computer documents, computer disks, materials on a computer hard drive, electronic mail, PDA records, records created or maintained in other electronic devices, or any other tangible things. The term "documents" also means originals, copies and drafts of all of the above upon which notations in writing, print, or otherwise have been made that do not appear on the originals.

Q. "Person" means any individual, corporation, partnership, joint venture, firm, association, group, organization, proprietorship, governmental body, or any other entity of any nature.

R. "Relate" and any variant thereof, including but not limited to "Relating to" and "Related to," when used in connection with any document, shall be understood to apply if the document directly or indirectly evidences, mentions, discusses, constitutes, concerns, supports, contradicts, refers to, or in any other way deals with the subject matter described in the request in which the term "Relate," or any variant thereof, appears.

S. The term "Concern" or any variant thereof, including but not limited to "Concerning," when used in connection with any communication shall be understood to apply if the communication directly or indirectly evidences, mentions, discusses, constitutes, relates, supports, contradicts, refers to, or in any other way deals with the subject matter described in the request in which the term "Concern," or any variant thereof, appears.

TOPICS

Defendant and Counter-Plaintiff VARIAN MEDICAL SYSTEMS, INC. requests Plaintiff University of Pittsburgh to respond within 30 days to the following requests: That Plaintiff produce and permit Defendant to inspect and to copy each of the following Documents:

1. All Documents identified in Plaintiff's Federal Rule 26 Disclosures.
2. All Documents relied upon or referred to in preparing Count I of the Complaint in this action.
3. All Documents Relating to Accused Varian Products.
4. All Documents Relating to the Plaintiff Patents, including but not limited to, All file histories of related patents and foreign counterparts.

5. All Documents and things Relating to Plaintiff's use of each of the alleged inventions described in each claim of each Patent-In-Suit.

6. All Documents and things Relating to the conception, design, development, actual reduction to practice or diligence in the reduction to practice of each alleged invention of each of the Patents-In-Suit, including without limitation, the first drawing or sketch of each such alleged invention, the first written description of each such alleged invention, Any discussion by Any Plaintiff committee, or Person on the need or acceptability of patenting the alleged invention, and the first disclosure of each such alleged invention to Any Person other than an alleged inventor thereof, also including but not limited to, All Documents concerning inventorship of the subject matter of each claim of each of the Patents-In-Suit.

7. All Documents that Relate to the inventor(s) for each of the claims in each of the Patents-In-Suit, including but not limited to All technical articles; publications, presentations, and the like, authored by, presented by, or in the possession of Any inventor of Any of the Patents-In-Suit, All lab notebooks, notes, experimentation documentation, hypothesis and results, invention disclosures, and other writings of such inventors.

8. For each of the inventors of each of the Plaintiff Patents, Documents sufficient to show or identify the period of employment, affiliation, or association with Plaintiff, including the Dates of hire and termination of such employment, affiliation, or association, and All Documents that Relate to the employment files of each such inventor.

9. For each of the inventors of each of the Plaintiff Patents, Documents sufficient to show current residence address of each such inventor.

10. For each of the inventors of each of the Plaintiff Patents, All Documents Relating to the inventor's involvement or contributions to conception and actual reduction to practice, in whole or in part, of the alleged invention described or claimed in his or her patent(s), and the Dates of such alleged involvement or contributions.

11. All Documents Relating to Plaintiff's diligence or lack thereof in its alleged reduction to practice of the alleged invention of each claim of each of the Patents-In-Suit.
12. All Documents Relating to the Dates on which, and the circumstances under which, Plaintiff and the inventors of the Patents-In-Suit first learned of the Prior Art identified to the United States Patent and Trademark Office during the prosecution of the Patents-In-Suit.
13. All Documents that Relate to Communications with Any Person, including, but not limited to, the inventors of the Patents-In-Suit, that Relate to actual or potential Prior Art for Any of the Patents-In-Suit, irrespective of whether or not the Prior Art has been cited to the United States Patent and Trademark Office.
14. All Documents Relating to inventor's beliefs for proof of concept and best mode for Any alleged invention within the scope of Any of the claims in Plaintiff Patents.
15. All Documents and things Relating to testing, developmental, experimental or research activities with respect to each alleged invention of each Patent-In-Suit, including without limitation, such activities Relating to the design, construction, and operation of the first device, apparatus, product, model, system, method, or prototype to operate for the intended purpose of each such alleged invention and to Any antecedent device, apparatus, product, model, system, method, or prototype thereof.
16. Documents sufficient to identify All Persons who participated in the design, development, implementation, debugging, testing, or evaluation of Any product, implementing or embodying, in whole or in part, the alleged invention of any claim of the Patents-In-Suit.
17. All Documents Relating to the functions, methods of operation and results of the alleged invention of each claim of the Patents-In-Suit.
18. All Documents Relating to Any Plaintiff policy, protocol, strategy, plan, or practice, whether formal or informal, stated or unstated, regarding patents, including but not limited to, filing and prosecution of All forms of patent applications (including but not limited to original applications, continuation applications, divisional applications, reissues, reexaminations,

and divisional applications), acquiring patents or patent applications from other persons, exploiting patents or patented technology, charging other persons with patent Infringement, enforcing patents, licensing patents or patented technology, or cross-licensing patents or patented technology.

19. All organizational charts of Plaintiff from the earliest Filing Date of the Patents-In-Suit to the present.

20. All Documents Relating to the file histories of the Plaintiff Patents.

21. All Documents Relating to Any patent application filed by Plaintiff anywhere in the world Relating to Any claim of the Patents-In-Suit.

22. All Documents Related to Ser. No. 715,834, filed with the U.S. Patent and Trademark Office on September 19, 1996, the preparation or prosecution of each foreign patent application corresponding, in whole or in part, to the U.S. applications, including requests for reexamination and reissue, for each Patent-In-Suit, including without limitation, All Documents Relating To Any Prior Art cited or considered by Plaintiff, the patentees, the inventors, the patent applicant, the patent applicant's attorney or agent or Any patent examiner, and Any conflict, interference, opposition, Infringement, nullity, revocation or other proceeding involving such foreign applications or Any patent issuing thereon, and Plaintiff's complete prosecution file for each such foreign application.

23. All Documents Related to Ser. No. 739,622, filed with the U.S. Patent and Trademark Office on October 29, 1996, including Any requests for reexamination and reissue, including without limitation, All drafts of such applications or requests, the complete prosecution file for each such application, and All applications from which it may claim priority, All Documents considered in connection with the preparation and prosecution of such applications or requests, and All Documents that passed in either direction between Any of Plaintiff's outside counsel, personnel or inventors, including without limitation to, or from the patentees, and to or from each patent attorney or agent in connection with or concerning the applications, prosecution

of the applications, or statements made to the U.S. Patent and Trademark Office concerning Any of the Patents-In-Suit.

24. All Documents and things Relating to Any embodiment of the alleged invention of Any of the Patents-In-Suit that were not disclosed to the U.S. Patent and Trademark Office, including but not limited to Any drawings, schematics, illustrations, writings, specifications, data sheets, and technical manuals.

25. All Documents and things Relating to Any decision or Communication to bring or not to bring Any information or material to the attention of the U.S. Patent and Trademark Office, either prior to, during or after the prosecution of the applications, including requests for reexamination or reissue, for each of the Patents-In-Suit.

26. All Documents and things Relating to Any consideration, evaluation, study, or analysis given as to whether or not an application for, an application for reissue of, or a request for reexamination of, Any of the Patents-In-Suit (including continuation, continuation-in-part, or divisional applications thereof or based thereon) should be prepared or filed.

27. All Documents Relating to the earliest description, in whole or in part, of the alleged invention of each claim of each of the Patents-In-Suit.

28. All Documents and things Relating to the preparation or prosecution of each foreign patent application corresponding, in whole or in part, to the U.S. applications, including requests for reexamination and reissue, for each Patent-In-Suit, including without limitation, All Documents Relating to Any Prior Art cited or considered by Plaintiff, the patentees, the inventors, the patent applicant, the patent applicant's attorney or agent or Any patent examiner, and Any conflict, interference, opposition, Infringement, nullity, revocation or other proceeding involving such foreign applications or Any patent issuing thereon, and Plaintiff's complete prosecution file for each such foreign application.

29. All Documents Relating to opinion letters referring to the Patents-In-Suit.

30. All Documents in the possession of Plaintiff Relating to the prosecution of each of the Plaintiff Patents, including but not limited to, invention disclosures, draft patent applications, patent applications, communications, and drafts of communications related to the prosecution of the Plaintiff Patents.

31. All Documents in the possession of Plaintiff's patent prosecution attorney(s) Relating to the prosecution of each of the Plaintiff Patents, including but not limited to, invention disclosures, draft patent applications, patent applications, communications, and drafts of communications related to the prosecution of the Plaintiff Patents.

32. All Documents Related to communications between Any patent prosecution attorney and Any Plaintiff representative regarding the prosecution of the Plaintiff Patents.

33. For each of the Patents-In-Suit, All Documents Relating to the transfer of ownership rights from inventor(s) of each patent to Plaintiff, including but not limited to, contracts, license agreements, assignments, and Any other Documents related to or tending to show chain of ownership from the inventor(s) of each of the patent to Plaintiff.

34. All Documents and Communications Relating to Plaintiff's Due Diligence efforts in the acquisition of Any of the Patents-In-Suit.

35. All Documents that describe the Plaintiff's belief of the value of Any of the Patents-In-Suit.

36. All textbooks, articles, journals, or other publications of Any kind Relating in Any way to each of the alleged inventions described in each claim of each of the Plaintiff Patents.

37. For each of the Plaintiff Patents, All printed publications Relating to the Plaintiff Patent and predate the Filing Date of such patent.

38. For each of the Patents-In-Suit, All Documents Relating to the first use, disclosure, display, demonstration, preview, or exhibit of Any product that uses or has ever used, in whole or in part, the alleged invention of any claim of such patent.

39. All Documents Relating to Prior Art or potential Prior Art to the Patents-In-Suit, including but not limited to pre-existing products, systems, methods, or descriptions that Relate to the subjects of the alleged inventions of the Patents-In-Suit.

40. All Documents distributed by or on behalf of Plaintiff to investors, insurers, or potential investors or insurers or other potential sources of funding that directly or indirectly Relate to Any of the Plaintiff Patents or the alleged inventions thereof, or the development, manufacture and/or sale of Any product incorporating Any of the alleged inventions of Any claim of the Patents-In-Suit.

41. All Documents Relating to Any long-felt need that has been filled by Any product implementing or embodying the alleged invention of Any of the claims of the Patents-In-Suit, including but not limited to, All such Documents and things which tend in Any way to support or negate a contention of long-felt need.

42. All Documents and things Relating to Any commercial success achieved by Plaintiff Products using the alleged invention of Any of the Patents-In-Suit, including without limitation, All such Documents and things which tend in Any way to support or negate a contention of commercial success, including Any Documents supporting a nexus between Any alleged invention of the Patents-In-Suit and the commercial success of such Plaintiff Products.

43. All Documents Relating to Any alleged failure by those skilled in the art to appreciate Any problem alleged to have been solved by Any alleged invention of Any of the claims of the Patents-In-Suit.

44. For each of the Patents-In-Suit, All Documents Relating to the marketability of, market demand for, or consumer acceptance of Any commercial embodiment of the alleged invention.

45. All Documents Relating to non-Infringing alternatives or acceptable substitutes, if Any, or the lack thereof, for Any alleged invention described in Any specification or Any claim or claims of the Patents-In-Suit.

46. All Documents Relating to Any secondary considerations that Any invention described in Any specification or Any claim or claims of the Patents-In-Suit is not obvious.
47. All Documents Relating to or tending to show copying by Any Person of the alleged inventions in the Patents-In-Suit.
48. All Documents cited in the Patents-In-Suit.
49. All Documents Related to Any Prior Art search for the Plaintiff Patents.
50. All Documents resulting from a Prior Art search Relating to the Plaintiff Patents.
51. For each of the Patents-In-Suit, All Documents Relating to the first offer for sale of Any Plaintiff Product implementing or embodying, in whole or in part, the alleged invention, or any claim of such Patent-In-Suit, and All other such offers within the following year.
52. For each of the Patents-In-Suit, All Documents Relating to the first actual sale of Any Plaintiff Product implementing or embodying, in whole or in part, the alleged invention, or any claim of such Patent-In-Suit, and All other such sales within the following year.
53. All Documents that Relate to Any differences or similarities between the scope and content of the subject matter of the Patents-In-Suit or the subject matter of Any claims of the Patents-In-Suit and one or more items of actual or potential Prior Art or one or more pre-existing products, systems, methods, or descriptions.
54. For each of the Patents-In-Suit, All Documents that Relate to promotional literature or other materials prepared or disseminated for Any product that incorporate any of the alleged inventions of Any of the claims of Any of the Patents-In-Suit prior to its Filing Date, including but not limited to, announcements, leaflets, pamphlets, product specification sheets, product brochures, product manuals, and advertising, and All drafts and All other Documents Relating to the preparation of Any of the foregoing.
55. All Documents and things Relating to Any lawsuit, or to the decision to bring such lawsuit, Alleging Infringement by Any Person other than Varian of one or more claims of Any of the Plaintiff Patents.

56. All Documents and things produced by or to Plaintiff or that will be produced by or to Plaintiff in Any civil action other than this action Alleging Infringement or involving a declaratory judgment of non-Infringement, invalidity or unenforceability concerning one or more claims of Any of the Plaintiff Patents, including without limitation, deposition transcripts, motions for summary judgment and supporting and opposing memoranda and proofs (affidavits, declarations, exhibits, and the like).

57. For each of the Plaintiff Patents, All Documents Relating to Any charge of Infringement made by Plaintiff to Any other Person and All Documents Relating to Any subsequent negotiations or Communications Relating to Any such charge.

58. For each of the Plaintiff Patents, All Documents and things Relating to the scope, validity or invalidity, Infringement or non-Infringement, or enforceability or unenforceability of each patent, and Any study, search, investigation, or opinion Relating to such topics.

59. All Documents and things Relating to Any lawsuit, arbitration or other legal proceeding involving Any foreign patent corresponding or Related to, in whole or in part, Any of the Plaintiff Patents.

60. All Documents Relating to Any instance where a third party has been accused of infringing Any claim of the Patents-In-Suit, including, but not limited to, the name and address of each third party, the circumstances surrounding the accusation, their response, and the resolution of the accusation (including the identification of any resultant litigation, arbitration, mediation, or other enforcement proceeding), if any.

61. All Documents and things Relating to the alleged Infringement by Varian of one or more claims in Any of the Plaintiff Patents.

62. For each of the Patents-In-Suit, All Documents and things that Relate to each and every claim that Plaintiff contends is Infringed by Accused Varian Products.

63. All Documents Relating to Plaintiff's first awareness of Any alleged Infringement or potential alleged Infringement by Varian of each of the Patents-In-Suit.

64. All Documents and things Relating to information Plaintiff possessed prior to the filing of the Complaint with respect to the construction or operation of Accused Varian Products, including without limitation, Any information which Plaintiff contends provided a basis for making such a charge of Infringement.

65. All Documents and things Relating to knowledge by Plaintiff of the alleged Infringement by Varian of one or more claims of Any of the Patents-In-Suit, including but not limited to, Documents Relating to Plaintiff's knowledge or acquisition of knowledge, suspicion, investigation, or conclusion that Varian used, manufactured, sold, or offered for sale Any products that Plaintiff contends employ Any alleged invention of Any claim of the Patents-In-Suit.

66. All Documents that Relate to Any term used in Any claim of the Patents-In-Suit.

67. All Documents Relating to the interpretation, scope or construction of each term within Any of the claims in the Patents-In-Suit.

68. All Documents supporting Plaintiff's proposed construction for Any of the claim terms of Any claim of Any of the Patents-In-Suit.

69. All Documents and things Relating to Any comparison of the structure, function, or operation of Any embodiments that use Any alleged invention within the scope of Any of the claims in Plaintiff Patents with Any of the Accused Varian Products.

70. All Documents Relating to Any study, evaluation or analysis by or on behalf of Plaintiff that Any Varian Product might Infringe Any Plaintiff Patent, regardless of the results of such evaluation or analysis.

71. All Documents and things Relating to Any study, evaluation, or analysis by or on behalf of Plaintiff that Any Product of Any Person other than Varian might Infringe Any Plaintiff Patent, including without limitation, Any notice, warnings or charge of Infringement to Any such Person.

72. All Documents Relating to Any analyses of the claims of the Patents-In-Suit, including but not limited to, claim charts, summaries, and Infringement analyses.
73. All Documents Relating to Any claim charts, draft claim charts, and analysis for Any of the Patents-In-Suit, including but not limited to, Documents comparing the structure, function, or operation of Any Varian product on the one hand and on the other, Any alleged invention within the scope of Any of the claims in Plaintiff Patents.
74. All Documents Relating to the decision to bring this lawsuit.
75. Any Documents that support Plaintiff's claim of willful Infringement.
76. Any Documents that support Plaintiff's claim that this is an exceptional case.
77. For each affirmative defense asserted by Varian, All Documents that Plaintiff alleges support its contention that each such affirmative defense does not bar Plaintiff's cause of action.
78. To the extent Plaintiff intends to rely on the Doctrine of Equivalents, All Documents supporting Plaintiff's Allegations that Any Accused Varian Product allegedly infringe Any alleged invention within the scope of Any of the claims in Plaintiff Patents under the Doctrine of Equivalents.
79. All Documents Relating to communications between Plaintiff and Any third party regarding the Patents-In-Suit, including All analyses, claim charts, and patents and publications Related To Any of the Patents-In-Suit.
80. All Documents that support Plaintiff's allegations in the Complaint.
81. All Documents that Plaintiff intends to rely on at trial.
82. All Documents that Relate to Communications between Plaintiff and Any Person Relating to products, systems, or methods embodying the invention of Any claim of Any of the Plaintiff Patents.

83. All Documents Relating to comparison of the design, structure, function, or operation of Accused Varian Products against the specification or Any claim of the Patents-In-Suit.

84. All Documents Concerning Any commercial embodiments made by Any Person of each asserted claim of the Patents-In-Suit, including but limited to Documents Concerning the products within the scope of each claim of each of the Patents-In-Suit.

85. All Documents Relating to the invention, design, engineering, development, testing or operation conducted by Plaintiff or Any third party of Any embodiment that is within the scope of Any of the claims in the Plaintiff Patents.

86. For each of the Patents-In-Suit, All Documents that Relate to the design or development of Any product implementing or embodying, in whole or in part, Any alleged invention of Any of the claims of Any of the Patents-In-Suit.

87. For each of the Patents-In-Suit, All publications, technical Documents, promotional literature, announcements, or other materials that Relate to Any product that embodies or implements, in whole or in part, Any of the alleged inventions of Any of the claims of Any of the Patents-In-Suit.

88. All Documents Relating to advertising, sales, and promotion of each Plaintiff Product that embodies or incorporates Any alleged invention of Any claim of Any of the Patents-In-Suit.

89. All Documents and things Relating to complaints or problems with the performance of each Plaintiff Product which uses alleged inventions of Any claim of Any of the Patents-In-Suit.

90. All Documents that evidence, refer or Relate to Any persons who participated in the design, development, implementation, debugging, testing, or evaluation of Any Plaintiff Products implementing or embodying, in whole or in part, Any of the alleged inventions in the Patents-In-Suit.

91. Documents including organizational charts sufficient to identify the names, job titles, and duties of Plaintiff's directors, officers, employees, contractors, and any third party involved in i) the creation, design, development, testing, evaluation, operation, public relations, sales, or marketing of Plaintiff Products, embodying or implementing, in whole or in part, Any of the alleged inventions within the scope of Any claim of Any of the Patents-In-Suit or ii) the licensing or other grant of rights in or to Any claim of Any of the Patents-In-Suit.

92. All Documents and things Relating to Any Communications, oral or in writing, between Plaintiff and Varian, including but not limited to All Documents Relating to the negotiations between Plaintiff and Varian regarding the licensing of Any of Patents-In-Suit.

93. All Documents that Relate to Any actual or potential license or option to license agreement, including without limitation, cross-licenses, agreements of non-assertion, covenants not to sue, acquisition agreements, and other types of agreements and/or negotiation for such that Relates to or involves Any Patents-In-Suit, including without limitation, All Documents Relating to Communications concerning Any such license agreement or negotiation.

94. All Documents that Relate to Any actual or potential license agreement, including without limitation, cross-licenses, agreements of non-assertion, covenants not to sue, acquisition agreements, and other types of agreements, and/or negotiation for such that Relates to or involves Any Plaintiff Patents, including without limitation, All Documents Relating to Communications Concerning Any such license agreement or negotiation.

95. All Documents the Relate to Plaintiff's licensing program, policy and practice, including but not limited to, All Documents Relating to Any Communications or decision regarding whether or not to assign, sell, transfer, license, or offer to assign, sell, transfer, or license to Any Person Any interest in the Patents-In-Suit.

96. All Documents that Relate to Any license agreement, including without limitation, cross-licenses, agreements of non-assertion, covenants not to sue, acquisition

agreement, and Any other types of agreements, and/or negotiation for such that Relates to Any prior owner or assignee of Any of the Patents-In-Suit.

97. All agreements, settlements and licenses entered into by Plaintiff Relating in whole or in part in Any way to one or more of the Patents-In-Suit.

98. All Documents Relating to Any license payments, royalties, or other consideration Plaintiff has received or expects to receive for licenses or other rights under the Patents-In-Suit.

99. All Documents and things Relating to Any notices, warnings or charges of Infringement considered by or made by Plaintiff to Varian in connection with Any of the Plaintiff Patents.

100. All Documents and things Concerning efforts of Any Person in marking any article with the patent numbers of the Patents-In-Suit, Any failure to mark, or Any other notice with respect to the Patents-In-Suit.

101. All Documents Relating to Any requirements that Plaintiff's licensee(s) of Any of the Patents-In-Suit must follow regarding patent markings in accordance with 35 U.S.C. § 287.

102. All Documents Related to Plaintiff's compliance with 35 U.S.C. § 287 Relating the Patents-In-Suit.

103. All Documents sufficient to identify Plaintiff's accounting practices and methods, including but not limited to, practices and methods for determining costs and profits.

104. All Documents Relating to Plaintiff tax returns starting from 1996 to the present.

105. All Documents Relating to communications between Plaintiff and tax authorities regarding the value of Any of the Plaintiff Patents.

106. All Documents Relating to communications between Any third party and tax authorities regarding the value of Any of the Plaintiff Patents.

107. All Documents Relating to communications with investment bankers, auditors, accountants, investors, and their agents, employees, and officers regarding the value of the Patents-In-Suit.

108. All Documents Relating to or tending to show a reasonable royalty for each of the Patents-In-Suit.

109. All Documents Relating to or tending to show royalty rates received by Plaintiff for licensing other patents that are directed to medical products, systems, methods, or services.

110. All Documents Relating to or tending to show an established royalty rate for each of the Patents-In-Suit.

111. All of Plaintiff's accounting Documents Relating to the Plaintiff Products that embody or implement the invention of Any claim of Any of the Patents-In-Suit, including but not limited to, Plaintiff's chart of accounts, accounting policies and procedures manuals, detailed year-end ledgers for the years 1996 through the present, detailed year-end general ledgers for the years 1996 to present, Federal Income Tax returns for the years 1996 through the present, audited financial statements for the years 1996 through the present, and unaudited financial statements for the years 1996 to the present.

112. All Documents Relating to or tending to show replacement of Prior Art products, systems, methods, services, devices, and apparatus by Plaintiff Products that embody or implement the invention of Any claim of Any of the Patents-In-Suit for reasons Relating to the alleged value or usefulness of such invention(s).

113. All Documents Relating to or tending to show portions of profits or selling prices of Plaintiff Products that are attributable to the value of the inventions claimed in the Patents-In-Suit.

114. For each of the Patents-In-Suit, All Documents Relating to sales of Any Plaintiff Products that embody or implement the invention of Any claim of Any of the Patents-In-Suit that

were not marked with or otherwise identified with the patent numbers of Any of the Patents-In-Suit associated with such Plaintiff Products.

115. For each of the Patents-In-Suit, All Documents that Relate to Communications between Plaintiff and Any purchaser, user, developer, or licensee (as to each, both potential and actual) of Any product implementing or embodying, in whole or in part, Any alleged invention of Any of the claims of the Patents-In-Suit.

116. All Documents that Relate to Plaintiff's costs for the manufacture and sale of Any Plaintiff Product that includes Any alleged invention of Any claim of the Patents-In-Suit.

117. All financial statements and reports of Plaintiff from the year Plaintiff first sold Any product that embodies, implements or uses, in whole or in part, Any alleged invention described in Any claim of Any of the Patents-In-Suit.

118. All Documents Relating to price lists, pricing memorandums, and pricing strategies for Plaintiff Products that embody or implement Any alleged invention of Any claims of Any of the Patents-In-Suit.

119. All Documents Relating to market segmentation, market approach, pricing, sales, and business plans for Plaintiff Products that embody or implement Any alleged invention of Any claims of Any of the Patents-In-Suit.

120. All Documents Relating to account representative(s), sales reports, status reports, call reports (weekly, monthly, bi-monthly, and yearly), and customer reports for Plaintiff Products that embody or implement the invention of Any claims of Any of the Patents-In-Suit.

121. All Documents Relating to sales reports of Plaintiff, including monthly, quarterly, and annual sales of Plaintiff Products that embody, implement, or use Any alleged invention of Any claim of Any of the Patents-In-Suit.

122. For All Plaintiff Products that embody or implement Any alleged invention of Any claim of Any of the Patents-In-Suit, All Documents Relating to sales contracts, invoices,

purchase orders, promotions, profitability margins, quantities sold, and Product lifetimes for All wholesale and retail distribution channels.

123. All Documents Relating to financial analyses Relating to Any of the Plaintiff Products that incorporate the alleged inventions of Any claim of the Patents-In-Suit, including but not limited to, market shares, sales projections, demand analyses, cost of components or materials, cost of labors, and profit margins.

124. All Documents that Relate to Any sales, offers for sale, sales inquiries, or purchase inquiries of Plaintiff products embodying the invention of Any claim of Any of the Patents-In-Suit.

Respectfully submitted,

PICADIO SNEATH MILLER & NORTON P.C.

/s/ Henry M. Sneath

Henry M. Sneath (PA 40559)
Shannon M. Clougherty (PA 88586)
4710 U.S. Steel Tower
600 Grant Street
Pittsburgh, Pennsylvania 15219-2702
Tel: 412-288-4000
Fax: 412-288-2405
hsneath@psmn.com
sclougherty@psmn.com
*Attorneys for Defendant Varian Medical Systems,
Inc.*

William L. Anthony (CA 106908)
Matthew H. Poppe (CA 177854)
Zheng Liu (CA 229311)
Orrick, Herrington & Sutcliffe LLP
1000 Marsh Road
Menlo Park, California 94025
Tel: 650-614-7400
Fax: 650-614-7401
wanthony@orrick.com
mpoppe@orrick.com
jenliu@orrick.com

Veronica Mullally (Admitted to NY Bar September 23, 1997)
Eileen M. O'Connor (Admitted to NY Bar March 29, 2005)
Orrick, Herrington & Sutcliffe LLP
666 5th Ave.
New York, NY 10103-0001
Tel: 212-506-5000
Fax: 212-506-5151
vmullally@orrick.com
eoconnor@orrick.com

Dated: May 23, 2007

OHS West:260230290.5
3424-2015 ZL0/ZL0

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the Defendant and Counter-Plaintiff Varian Medical Systems, Inc.'s Request for Production of Documents Under Rule 34 has been served upon all parties either individually or through counsel via:

- | | |
|-------------------------|---|
| <u> </u> | Hand-Delivery |
| <u> </u> | Facsimile |
| <u>X</u> | First Class, US Mail, Postage Prepaid |
| <u> </u> | Certified Mail-Return Receipt Requested |
| <u> </u> | ECF Electronic Service |
| <u>X</u> | Email |

at the following addresses:

Christopher K. Ramsey
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
cramsey@morganlewis.com

David W. Marston Jr.
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
dmarston@morganlewis.com

Daniel Johnson, Jr.
Allison K. Young
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Squire, Suite 700
3000 El Camino Real
Palo Alto, CA
djohnson@morganlewis.com
allison.young@morganlewis.com

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: May 23, 2007

/s/ Henry M. Sneath

Henry M. Sneath, Esquire
Pa. I.D. No. 40559
Shannon M. Clougherty, Esquire
Pa. I.D. No. 88586
4710 US Steel Tower
600 Grant Street
Pittsburgh, PA 15219-2709
Counsel for Defendant

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH,

Plaintiff,

v.

VARIAN MEDICAL SYSTEMS, INC.

Defendant.

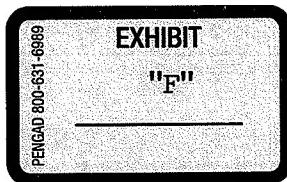
Case No. 2:07-CV-00491 (AJS)

**DEFENDANT VARIAN MEDICAL
SYSTEMS, INC.'S NOTICE OF
DEPOSITION OF PLAINTIFF
UNIVERSITY OF PITTSBURGH
PURSUANT TO FRCP 30(b)(6)**

TO ALL COUNSEL OF RECORD:

PLEASE TAKE NOTICE that, pursuant to Rule 30(b)(6) of the Federal Rules of Civil Procedure, Defendant Varian Medical Systems, Inc. will take the deposition of the University of Pittsburgh ("UPitt"). The deposition will commence at 9:00 a.m. on October 2, 2007, at the office of Picadio Sneath Miller & Norton, PC, 4710 U.S. Steel Tower, 600 Grant Street, Pittsburgh, Pennsylvania 15219-2702, and will continue from day to day thereafter, excluding weekends and holidays, until it is completed. The University of Pittsburgh shall designate and make available one or more officers, agents, or other persons who can testify on its behalf with respect to the matters listed in Attachment A hereto.

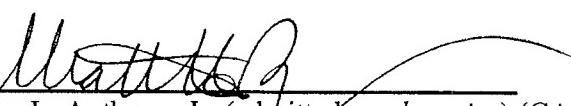
The University of Pittsburgh is requested to provide to counsel for Varian, on or before October 2, 2007, a written designation of the name and position of the person who will testify on its behalf concerning each topic listed in Attachment A hereto.



The deposition will be taken upon oral examination before an officer authorized by law to administer oaths. The deposition will be recorded stenographically, as well as by instant visual display of testimony using LiveNote software.

Dated: September 13, 2007

ORRICK, HERRINGTON & SUTCLIFFE LLP

By: 

William L. Anthony, Jr. (admitted *pro hac vice*) (CA 106908)
Matthew H. Poppe (admitted *pro hac vice*) (CA 177854)
Zheng (Jen) Liu (admitted *pro hac vice*) (CA 229311)
1000 Marsh Road
Menlo Park, CA 94025
(650) 614-7400
(650) 614-7401 (fax)
wanthony@orrick.com
mpoppe@orrick.com
jenliu@orrick.com

Henry M. Sneath, Esquire

hsneath@psmn.com

Pa. I.D. No. 40559

Shannon M. Clougherty, Esquire

sclougherty@psmn.com

Pa. I.D. No. 88586

PICADIO SNEATH MILLER & NORTON, P.C.

600 Grant Street, Suite 4710

Pittsburgh, PA 15219

(412) 288-4000 [T]

(412) 288-2405 [F]

**ATTACHMENT A TO NOTICE OF DEPOSITION OF PLAINTIFF
UNIVERSITY OF PITTSBURGH PURSUANT TO FRCP 30(b)(6)**

DEFINITIONS AND INSTRUCTIONS

A. "Documents" is used in its broadest sense and means the originals and any non-identical copies and drafts of any writings, as defined by Federal Rule of Evidence 1001 to mean anything consisting "of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation," and including, but not limited to, all contracts, policy statements, manuals, telephone messages, checks, correspondence, letters, telegrams, notes, mailgrams, minutes of any meetings, agendas, memoranda, interoffice communications, reports, studies, forecasts, working papers, charts, expense account reports, ledgers, journals, financial statements, statements of account, calendars, appointment books, diaries, drawings, diagrams, graphs, schematics, specifications, blueprints, layouts, mask sets, photographs, sound recordings, video recordings, computer documents, computer disks, materials on a computer hard drive, electronic mail, PDA records, records created or maintained in other electronic devices, or any other tangible things. The term "documents" also means originals, copies and drafts of all of the above upon which notations in writing, print, or otherwise have been made that do not appear on the originals.

B. "UPitt" means plaintiff University of Pittsburgh and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, colleges, schools, departments, institutes, hospitals, and all other persons and entities representing it or acting on its behalf.

C. "UPMC" means the University of Pittsburgh Medical Center and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, colleges, schools, departments,

institutes, hospitals, and all other persons and entities representing it or acting on its behalf.

D. "CMU" means Carnegie Mellon University and its past or present directors, officers, parents, subsidiaries, predecessors, successors, assigns, agents, servants, employees, investigators, attorneys, colleges, schools, departments, institutes, and all other persons and entities representing it or acting on its behalf.

E. "Communication" refers to any contact, oral or documentary or electronic, formal or informal, at any place or under any circumstances whatsoever whereby information of any nature is transmitted or transferred, including, without limitation, a single person seeing or hearing any information by any means.

F. "Relate" and any variant thereof, including "relating to" and "related to," means referring to, relating to, pertaining to, relevant to, material to, embodying, evidencing, affecting, comprising, discussing, dealing with, supporting, contradicting or otherwise considering in any manner whatsoever the subject matter of the inquiry.

G. "Relate" and any variant thereof, including "relating to" and "related to," when used in connection with any document, shall be understood to apply if the document directly or indirectly evidences, mentions, discusses, constitutes, concerns, supports, contradicts, refers to, or in any other way deals with the subject matter described in the request in which the term "relate" or any variant thereof appears.

H. "Any" and "all" refer to and include the other; the terms "and" and "or" shall each mean and include the other, and the singular form of any word and the plural form of the word shall each mean and include the other.

I. "Person" means any individual, corporation, partnership, joint venture, firm, association, group, organization, proprietorship, governmental body, or any other entity of any nature.

J. "Thing" means any physical object other than a "document."

K. "Patents-in-suit" refers to U.S. Patent Nos. 5,784,431 and 5,727,554, or either of them.

L. "Patents-in-suit and related applications" refers to the patents-in-suit, as well as all patents, patent applications, continuation applications, continuation-in-part applications, and divisional applications, whether published or unpublished, U.S. or foreign, that cite the patents-in-suit, incorporate them by reference or otherwise, claim priority from or are used as a basis for the priority date for these patent applications.

M. "Patented inventions" means the inventions described in the patents-in-suit and related applications.

N. The "192 Patent" refers to U.S. Patent No. 5,823,192.

O. "Named inventors" means Andre M. Kalend, Joel Greenberger, Karun B. Shimoga, Charalambos N. Athanassiou, and Takeo Kanade.

P. "Varian" means Varian Medical Systems, Inc. and its past or present predecessors, subsidiaries, divisions, affiliates, and representatives.

Q. "Lawsuit" means *University of Pittsburgh v. Varian Medical Systems, Inc.*, Case Number 07-CV-00491 (AJS) (W.D. Pa.).

DEPOSITION TOPICS

1. The conception and reduction to practice of the Patented Inventions.
2. All research related to the Patented Inventions.
3. The involvement of any employee or representative of UPitt, UPMC, CMU, or any other entity, including but not limited to the Named Inventors, in the conception and reduction to practice of the Patented Inventions and any research related to the Patented Inventions.
4. All agreements relating to the conception of the Patented Inventions, reduction to practice of the Patented Inventions, or any research related to the Patented

Inventions, including but not limited to agreements between UPitt on the one hand and UPMC, CMU, Varian, Elekta Oncology Systems, Inc. (or any related company), Siemens Medical Systems, Inc. (or any related company), or the Named Inventors on the other.

5. The prosecution of the Patents-In-Suit and Related Applications.
6. The prosecution of all foreign counterparts to the Patents-In-Suit and Related Applications.
7. The search for and identification and disclosure to the U.S. Patent and Trademark Office of any actual or potential prior art in connection with the prosecution of the Patents-In-Suit and Related Applications.
8. The instructions given to the Named Inventors and other Persons involved in the prosecution of the Patents-In-Suit and Related Applications related to searching for actual or potential prior art and disclosing it to the U.S. Patent and Trademark Office in connection with said prosecution.
9. Current and past ownership of the Patented Inventions and/or the Patents-In-Suit and Related Applications and all property rights therein.
10. All agreements relating to Ownership of the Patented Inventions and/or the Patents-In-Suit and Related Applications or any property rights therein, including but not limited to agreements relating to the transfer or assignment of any such rights.
11. The division of property rights associated with patents, including but not limited to the Patents-In-Suit, between the University of Pittsburgh and UPMC upon UPMC's establishment as a separate legal entity from the University of Pittsburgh.
12. The assignments executed by the Named Inventors in connection with the Patents-In-Suit.
13. The respective rights of UPMC, CMU, the Named Inventors, and any other Person to any amounts obtained by the University of Pittsburgh in connection with this Lawsuit.

14. The Policy Guidelines on Intellectual Property Rights and Technology Transfer Procedures in Collaborative Projects of the University of Pittsburgh and Carnegie Mellon University, and any other policy or agreement related to the same or similar subject matter from 1994 to the present.
15. All licenses related to the Patents-In-Suit or the '192 Patent, or to any related applications or inventions.
16. All royalties or other consideration paid or delivered in connection with any license related to the Patents-In-Suit or the '192 Patent, or to any related applications or inventions.
17. All attempts to license the Patents-In-Suit, the '192 Patent, or any related applications or inventions.
18. All inquiries or expressions of interest by third parties, including but not limited to John Manzetti, regarding the possibility of licensing the Patents-In-Suit, the '192 Patent, or any related applications or inventions.
19. All attempts by UPitt to enforce the Patents-In-Suit, including but not limited to cease-and-desist letters, licensing demands, notices of infringement, litigation, and discussions related to any of the above.
20. The identity of all products, systems, or technologies sold or used by any Person at any time that UPitt believes have infringed any claim of the Patents-In-Suit.
21. All licenses of patent rights related to radiation therapy technology or other medical device technology to which UPitt has been a party, as either licensor or licensee, at any time from 1998 to the present, including but not limited to the terms thereof and all royalties and other consideration paid or delivered pursuant thereto.
22. UPitt's policies and practices from 1998 to the present related to the setting of royalty rates in patent licenses for patents owned in whole or in part by UPitt.
23. UPitt's valuation of the Patented Inventions, the Patents-In-Suit, the '192 Patent, or the invention(s) of the '192 Patent.

24. All products, prototypes, or technologies sold or offered for sale by UPitt at any time that incorporated any of the Patented Inventions.

25. UPitt's revenues, costs, and profits associated with the sale by UPitt at any time of any product, prototype, or technology that incorporated any of the Patented Inventions.

26. The facts and circumstances surrounding any potential sale of any product, prototype, or technology that UPitt believes it lost as a result of Varian's alleged infringement of the Patents-In-Suit, including but not limited to the amount of the expected revenue, costs, and profit associated with each such lost sale.

27. The facts and circumstances surrounding any potential revenue or income that UPitt believes it lost as a result of Varian's alleged infringement of the Patents-In-Suit, including but not limited to the amount of any such lost revenue or income and the amount of any associated cost or profit.

28. The disclosure of information to Varian related to the Patented Inventions or the Patents-In-Suit at any time prior to the filing of this Lawsuit.

29. Discussions between Varian on the one hand and UPitt, UPMC, or any of the Named Inventors on the other hand in 1994 and 1997 related to the possibility of collaboration or funding for research related to the subject matter of the Patents-In-Suit.

30. Discussions between UPitt, UPMC, CMU, or any of the Named Inventors on the one hand and any other Person on the other hand, including but not limited to Elekta Oncology Systems, Inc. (or any related company) and Siemens Medical Systems, Inc. (or any related company), at any time either before or after the filing of the patent applications associated with the Patents-In-Suit, related to the possibility of collaboration or funding for research related to the subject matter of the Patents-In-Suit.

31. The agreement between UPitt, CMU, and Elekta Oncology Systems, Inc. dated October 29, 1998, including but not limited to its creation and termination, the parties' performance thereunder, and any related litigation.

32. All discussions between UPitt on the one hand and UPMC, CMU, any of the Named Inventors, or any other Person on the other hand, relating to the Lawsuit.

33. All discussions between UPitt on the one hand and UPMC, CMU, any of the Named Inventors, or any other Person on the other hand, relating to actual or potential infringement of the Patents-In-Suit by Varian or any other Person.

34. UPitt's awareness, acquisition, possession, ownership, and use of any of the following Varian products from 1998 to the present: Clinac®, Trilogy™, Acuity™, PortalVision™, On-Board Imager®, and RPM Respiratory Gating System.

35. UPitt's knowledge of UPMC's acquisition, possession, ownership, and use of any of the following Varian products from 1998 to the present: Clinac®, Trilogy™, Acuity™, PortalVision™, On-Board Imager®, and RPM Respiratory Gating System.

36. UPitt's investigation of alleged infringement of the Patents-In-Suit by Varian prior to the filing of the Lawsuit.

37. UPitt's reasons for not filing suit against Varian for alleged infringement of the Patents-In-Suit prior to April 2007.

38. Requests by UPitt or its counsel, at any time from 2005 to the present, to view, operate, test, reverse engineer, or otherwise examine any of the following Varian products for purposes of investigating alleged infringement of the Patents-In-Suit by Varian: Clinac®, Trilogy™, Acuity™, PortalVision™, On-Board Imager®, and RPM Respiratory Gating System.

39. The documents produced by UPitt to Varian in connection with this Lawsuit, including but not limited to their authenticity and their manner of creation and retention.

40. The basis for any claim of attorney-client privilege or attorney work product related to any document listed in UPitt's privilege logs served in connection with this Lawsuit.

41. The basis for any claim of attorney-client privilege or attorney work product related to any redaction from any document produced by UPitt in connection with this Lawsuit.

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of **DEFENDANT VARIAN MEDICAL SYSTEMS, INC.'S NOTICE OF DEPOSITION OF PLAINTIFF UNIVERSITY OF PITTSBURGH PURSUANT TO FRCP 30(b)(6)** has been served upon all parties either individually or through counsel via:

- Hand-Delivery
 Facsimile
 First Class, US Mail, Postage Prepaid
 Certified Mail-Return Receipt Requested
 Email
 Overnight Delivery

at the following addresses:

Ahren C. Hoffman, Esq.
Morgan Lewis & Bockius, LLP
2 Palo Alto Square
3000 El Camino Real, Suite 700
Palo Alto, CA 94306
ahoffman@morganlewis.com

Dated: September ___, 2007

Type or Print Name

Signature

EXHIBIT M

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)
Plaintiff,) Civil Action No. 2:07-CV-00491-AJS
v.) Judge Arthur J. Schwab
VARIAN MEDICAL SYSTEMS, INC.) Filed Electronically
Defendant.)

**PLAINTIFF UNIVERSITY OF PITTSBURGH'S REPLY TO [256] OBJECTIONS TO
REPORT AND RECOMMENDATION**

I. INTRODUCTION.

The inventors assigned all right, title, and interest in the patents-in-suit to UPitt. No other entity was assigned these rights, not even CMU. Thus, UPitt has standing to sue.

Any interest that CMU may have in the patents-in-suit is, at most, an interest in the net proceeds generated from UPitt's commercialization – including the pending litigation. CMU knew that the inventors assigned the patents-in-suit to UPitt; and, CMU knew that UPitt was the sole entity responsible for commercializing the patents-in-suit, which UPitt pursued at all times. Again, UPitt has standing to sue.

The sole purpose for suggesting that CMU be joined as a party plaintiff was to reduce the burden on the Court and the parties. At no time has UPitt or CMU asserted that anyone other than UPitt was the sole entity to whom the inventors assigned their rights. The inventors, CMU, and UPitt all agreed – UPitt has standing to sue.

The Special Master reviewed the parties' papers regarding both Varian's summary judgment motion and UPitt's motion to join CMU. After considering the papers, the Special Master recommended that CMU be joined as a party plaintiff, and provided two procedural methods to accomplish this goal. At the heart of the Special Master's report and recommendation was moving the case forward as justice requires, and maximizing judicial efficiency.

Recognizing the Special Master's efforts to resolve this issue, CMU's willingness to join as a party plaintiff, and the lack of prejudice such an addition would impose on the Court or Varian, UPitt agreed to the Special Master's recommendation. However, in line with the goals of justice and maximizing judicial efficiency, UPitt supported one of the Special Master's procedures over the other, that being, granting UPitt's motion to join CMU and denying Varian's summary judgment motion as moot. Following this second procedure promotes justice, and maximizes judicial efficiency.

Varian chose a different tactic. First, it argues that the Special Master did not have before him Varian's arguments opposing the joinder of CMU to the case. Yet, the Special Master, who

receives all filings through the ECF system, specifically cataloged the summary judgment and joinder docket in his report. Varian then argues that adding CMU now will not fix the problem. Yet, the cases relied upon run counter to their position, or are simply irrelevant. Then, Varian makes one of its inappropriate Rule 11 arguments. Lastly, Varian claims it will be prejudiced, but no such prejudice exists. CMU has been an active participant in this litigation by responding to discovery propounded by Varian. CMU has done this despite not being the institution responsible for prosecuting or commercializing the patents-in-suit or the legal title holder of the patents-in-suit. The responsible institution was UPitt – the complete and only legal title owner. Varian's arguments merely demonstrate its pointed effort to harass and increase the cost of litigation.

II. UPITT IS THE SOLE LEGAL TITLE HOLDER TO THE PATENTS-IN-SUIT.

Patent ownership begins with the inventor. Typically, inventors assign all right, title, and interest in the patent for some consideration. Such assignments are a matter of form for most companies and universities, and as such, the instrument used is also a form. Nothing is unusual with this process. In fact, the United States Patent and Trademark Office provides a form with boilerplate language for inventors to assign their rights in a patent (or patent application). *See* www.uspto.gov/web/forms/sb0015.pdf. The relevant language from the USPTO's assignment form transfers rights that were also transferred in the assignment from the inventors to UPitt. *See* Varian's MSJ, Exh. K-L (Docket No. 130).¹

USPTO

"I/We, the applicant(s), by these presents do **sell, assign, and transfer** unto said assignee the full and exclusive right to the said invention in the United States and the **entire rights, title and interest in and to any and all** Patent which may be granted therefore in the United States." (emphasis added)

UPitt

"Hereby **sell, assign and transfer** to the **University of Pittsburgh** of the Commonwealth System of Higher Education ... its successors, assigns and legal representatives, my/our **entire right, title and interest for all countries, in and to any and all** inventions and improvements which are disclosed and claimed, and any and all improvements which are disclosed but not claimed" (emphasis added)

¹ Defendants' Appendix to Motion for Summary Judgment for Lack of Standing, or in the Alternative, Motion for a Preliminary Hearing on the Issue of Standing.

The importance of including the proper language in an assignment did not escape UPitt. Thus, UPitt's use of a form to transfer legal title demonstrates the importance of ensuring that the assignments were complete. With these assignments, UPitt obtained legal title to the patents-in-suit and the standing to sue for infringement.

III. CMU KNOWINGLY CONSENTED TO UPITT'S LEGAL TITLE TO THE PATENTS-IN-SUIT TO FURTHER UPITT'S "SOLE RESPONSIBILITY FOR THE COMMERCIALIZATION".

CMU and UPitt created policies for joint development projects. *See* Varian's MSJ, Exhs. P-Q. These policies outlined the intent of the two institutions, when read in their entirety. For the collaborative project that resulted in the patents-in-suit, UPitt was identified as the institution with "the sole responsibility for commercialization of the IP disclosures". *See* Varian's MSJ, Exh. P at §F(2), Exh. Q at §F(2), Exh. I at 93:25-95:21. Yet, before UPitt could begin commercializing the patents-in-suit, it needed legal title. Hence, the inventors, with CMU's knowledge, made the assignment to UPitt. *See* Varian's MSJ, Exhs. K-L (Assignments); Exh. I at 101:15-102:22.

While the policies state that all IP jointly developed would be jointly owned by UPitt and CMU, that joint ownership was subject to administration under the policy. That same policy provided instruction for assigning legal title once an institution was identified as having the sole responsibility for commercialization. Without legal title of the patents resting in one institution, that institution cannot be solely responsible for commercializing the IP. Thus, when UPitt was given the sole responsibility of commercializing the patents, it was given legal title through the written assignments from the inventors. For over ten years, CMU knew about this transfer of title and did nothing to change the result.²

² Ownership in a patent may only be transferred through a written instrument. *See* 35 U.S.C. §261. Thus, when the inventors assigned the patents to UPitt, it was done as required by law. To the extent that the Special Master or Varian believes CMU should also be an owner, that issue is for CMU and UPitt to resolve, for example, through inter-institutional agreements. Yet, CMU has not raised any such concern. Rather, CMU continues to follow the Joint Policies and does not interfere with UPitt's commercialization efforts. Moreover, CMU understands that the

At most, CMU retained a fiduciary interest in any benefits generated through UPitt's commercialization efforts for exclusive rights. CMU does not have legal title to the patents-in-suit. According to the policies, CMU could only gain legal title in the patents-in-suit if UPitt chose to "turn back a Disclosure [*i.e.*, the patents-in-suit] to the inventors". *See* Exh. P at §F(2). UPitt never made that choice; thus, CMU never had the opportunity to obtain legal title of the patents-in-suit.

While UPitt is solely responsible for the commercialization of the patents-in-suit, the collaborative nature of the project promoted open communication with CMU. Thus, UPitt kept CMU informed and even sought its input for the commercialization efforts. This included consulting with CMU when a third-party considered exclusively licensing the patents-in-suit, which could cap the maximum benefit received from commercialization of the IP. Given that the intent of the policy was collaborative, and specifically stated that both UPitt and CMU should be "sensitive and responsible to any special circumstances ... of the other university, and will consult with the other [university] on such issues," UPitt consulted with CMU. Yet, consulting and being sensitive to the others' interest does not transfer legal title to the patents-in-suit. Rather, UPitt was, and is, the holder of "legal title" to the patents-in-suit, and as such, the entity with standing to sue Varian for patent infringement. *See Arachnid, Inc. v. Merit Industries, Inc.*, 939 F.2d 1574, 1579 (Fed. Cir. 1991) ("The general rule is that one seeking to recover money damages for infringement of a United States patent (an action 'at law') must have held *legal title* to the patent *during the time of the infringement.*"')(emphasis in original).

IV. IN THE INTEREST OF JUDICIAL EFFICIENCY, CMU IS WILLING TO JOIN AS A PLAINTIFF, EVEN THOUGH IT DOES NOT HAVE LEGAL TITLE TO THE PATENTS-IN-SUIT.

UPitt disagrees with Varian's characterization regarding ownership of the patents-in-suit. UPitt is the sole legal title owner, and the sole party responsible for commercializing the patents-in-suit. However, Varian's singular intent to harass and increase the cost of litigation by re-

inventors will be compensated by UPitt, not CMU, from any proceeds as a result of UPitt's commercialization efforts. *See* [SEALED] Appendix A (Wooldridge Depo.), at 105:14-110:19.

arguing the standing issue at every turn prompted UPitt to ask CMU if it would join the case as a party plaintiff.³ CMU had already been an active participant, producing documents and a witness for a 19-topic deposition. Also, all of the inventors, including the three employed with CMU during the project development, produced documents and were deposed by Varian. Thus, in an attempt to reduce the burden on the Court, UPitt requested and CMU agreed to join as a party plaintiff. The purpose for this proposed joinder was to promote judicial efficiency and to moot any further concerns about standing raised by Varian.

UPitt does not agree with the Special Master's interpretation of the joint policies, or that CMU has any legal title in the patents-in-suit. However, in order to maximize judicial efficiency and promote justice, the Court should adopt the Special Master's recommendation to join CMU, without any form of dismissal of this case. Any other result will send the message to Varian that tactics such as these will be entertained and condoned in the future, which is the wrong message to send.

V. ALL ARGUMENTS WERE BRIEFED BY THE PARTIES AND CONSIDERED BY THE SPECIAL MASTER.

The Special Master receives every filing made through the ECF System. Hence, he has before him every argument either party makes, including those regarding Varian's summary judgment motion and UPitt's motion to join CMU. In fact, the Special Master specifically cataloged these issues in his Report and Recommendation, signaling to everyone that he considered every argument presented in these papers. *See* Special Master's R&R at 2. Varian's argument to the contrary is plainly false and misleading.

VI. WHILE UNNECESSARY, ADDING CMU AS A PLAINTIFF WILL RESOLVE ANY ISSUES OF DOUBT THAT ALL PROPER PARTIES ARE JOINED TO THIS ACTION.

First, UPitt is the legal title owner of the patents-in-suit, as evidenced by the assignment from the inventors to UPitt. Since all patent owners must be party to any infringement suit, UPitt

³ One of the principal assertions Varian makes in its Rule 11 motion is that UPitt does not have standing to sue without CMU.

is the named plaintiff; thus, Varian's summary judgment motion should be denied. *See Arachnid*, 939 F.2d at 1579 (holding that the plaintiff must hold legal title during the time of alleged infringement).

However, to the extent that the Court believes that CMU retains a legal ownership interest in the patents-in-suit (as opposed to an equitable ownership interest), and thereby that UPitt has fewer than all substantial patent rights, then the issue is prudential rather than constitutional. *See Intellectual Property Development, Inc. v. TCI Cablevision of California, Inc.*, 248 F.3d 1333, 1348-49 (Fed. Cir. 2001). As a prudential principle, UPitt still has standing to sue, but all other legal owners in the patents should also be joined. *Id.* at 1348.

In *Abbott Labs v. Diamedix Corp.*, 47 F.3d 1128, 1129 (Fed. Cir. 1995), the exclusive licensee filed an infringement suit without the patent owner. Although the court determined that the patent owner's joinder was "required as a matter of statutory standing," the court did not dismiss the case for lack of jurisdiction and require that the patent owner and exclusive licensee jointly refile. *Id.* at 1133. Rather, the court reversed the district court's denial of the patent owner's motion to join. *Id.* Consistent with the court's resolution in the *Abbott* case, UPitt responded to the Special Master's R&R suggesting that the court adopt the Special Master's recommendation to vacate UPitt's motion to join CMU and deny Varian's summary judgment as moot. This remains UPitt's position.

Varian argues that all owners must be present from the start, but fails to address the Special Master's recommendation to add CMU to resolve any standing issue. For support, Varian principally relies on *Switzer Bros., Inc. v. Byrne*, 242 F.2d 909 (6th Cir. 1957), a case which is not on point. In *Switzer Bros.*, the licensee brought a patent infringement suit in 1953 without joining the owners of the patents. During the pendency of the infringement suit, the court held that the assignments to the patents were not effective; and thus, the plaintiff lacked sufficient rights to sue on the patents. The plaintiff then received quitclaim deeds to the patents, but the court dismissed the action because the quitclaim deeds did not cure the standing issue during the relevant period – the two years while the case was pending. The plaintiffs in *Switzer*

Bros. did not seek to join the other assignees to the patents.

Switzer Bros. was decided before the 1966 Amendments to Rule 19, and as such, its precedential value is suspect. For example, more recent case authority holds that a patent's co-owner may not be an indispensable party to an infringement action if the shaping of relief can avoid any possible prejudice. *See, e.g., E-Z Bowz, L.L.C. v. Professional Product Research Co., Inc.*, No. 00 Civ. 8670 LTS GWG, 2003 WL 22064257, at *5 (S.D.N.Y. Sep. 5, 2003). Also, with "the adoption of the 1966 amendments to Rule 19 'makes inappropriate any contention that patent co-owners are *per se* indispensable in infringement suits.'" *Howes v. Medical Components, Inc.*, 698 F. Supp. 574, 576 (E.D. Pa. 1988). However, if the Court finds that CMU is a necessary party, and joinder is feasible, then it must order that CMU be made a party, rendering Varian's motion summary judgment motion moot. *See Fed. R. Civ. P. 19(a)(2)* ("If a person has not been joined as required, the court must order that the person be made a party."); *see, also, Abbott Labs.*, 47 F.3d at 1133 (joinder of patentee by exclusive licensee is 'required as a matter of statutory standing' and consistent with Rule 19); *Control Components, Inc. v. Atlantic Richfield Co.*, 439 F. Supp. 654, 656 (C.D. Cal. 1977) (permitting exclusive licensee to amend complaint to join patent owner under Rule 19).

CMU is subject to service of process, and joinder will not deprive the court of subject-matter jurisdiction. *See Motion to Join CMU* (Docket No. 149). Moreover, CMU consents to being joined if the court requires its presence. *See Paul Decl. in Support of UPitt's Motion to Join CMU* (Docket No. 150), Exh. 4 (Wooldridge Decl.). Thus, no matter what method this court follows, Varian's request to dismiss the case should be denied. *See, e.g., Control Components*, 439 F. Supp. at 656 (holding that dismissal is not appropriate when the party to be joined is resident of the judicial district and subject to service of process).

VII. VARIAN WILL NOT BE PREJUDICED IF CMU IS ADDED AS A PARTY.

None of Varian's claims of prejudice have merit. If CMU is added as a party, consistent with UPitt's sole responsibility for commercializing the patents-in-suit, UPitt anticipates that

CMU will adopt the infringement contentions made by UPitt. Also, UPitt anticipates that CMU will also not object on Fed. R. Evid. 804(b)(1) grounds to any deposition taken in this case where CMU was not present, so long as UPitt was present.

As to discovery from CMU, including Varian's decision to modify the scope of its requests, that was Varian's choice. Varian received answers to all its questions from CMU, in whatever form the question was posed. Varian certainly has not treated non-parties any differently than parties in this litigation. For example, Dr. Kalend (a non-party) produced boxes of documents in the manner they are kept. But, when Varian didn't like the manner in which they were kept, Varian demanded that the documents be reorganized. Varian also obtained additional deposition time for four non-parties: Mr. Athanassiou, Dr. Shimoga, Eckert Seamans, and Dr. Kalend. During these depositions, Varian focused almost exclusively on further developing a charge of inequitable conduct, despite having unduly delayed in seeking leave to add such a charge. *See Docket No. 252.* There is no doubt that Varian will use any and all litigation tactics to obtain discovery. Thus, the fact that Varian chose to seek different discovery from CMU than it did UPitt is irrelevant to the question of Varian's alleged prejudice. Varian will suffer no prejudice if CMU is added at this time.

Varian next argues that an appellate court might disagree with this Court adding CMU as a party. However, there is no possible way to know exactly what an appellate court will do when a case is presented. But, standing is not the exclusive realm of district courts. Deciding jurisdiction is well within the appellate court's realm. *See Mentor H/S, Inc. v. Medical Device Alliance, Inc.*, 240 F.3d 1016, 1018-1019 (Fed. Cir. 2001) ("Moreover, we are confident that it is within our jurisdiction as an appellate court to consider Mentor's standing to bring suit, even though the issue was not raised in the district court."). If Varian's argument was followed, then no case would proceed when the parties disagreed on an issue, a result one could hardly imagine. It is better to resolve the issues now rather than re-litigate them through a new lawsuit.

For support of this argument, Varian cites to a 2005 California case where an appellate court found that under California's Code of Civil Procedure, Section 916, the trial court is

divested of subject matter jurisdiction of any matter embraced or affected by the appeal during the pendency of that appeal. *See Varian Medical Systems, Inc. v. Delfino*, 35 Cal. 4th 180, 196-97. The *Delfino* case has no bearing on the issue before this Court. Here, we have a dispute as to whether CMU should be joined as a party plaintiff, not whether the case should be stayed pending appeal. For the issue before this Court, subject matter jurisdiction exists. The issue is whether all parties are present for justice to prevail. The "Federal Rules of Civil Procedure permit courts to drop or add parties 'at any stage of the action and on such terms as are just.'" *Mentor H/S*, 240 F.3d at 1019 (citing Fed. R. Civ. P. 21 – Misjoinder and Nonjoinder of Parties). If the Court finds that CMU is an indispensable party, then it must be joined, thereby promoting the interest of justice and minimizing the prejudice to all parties. *See* Fed. R. Civ. P. 19 and 21; *see, also*, *Abbott Labs.*, 47 F.3d at 1133; *Control Components, Inc. v. Atlantic Richfield Co.*, 439 F. Supp. 654, 656 (C.D. Cal. 1977). Moreover, since CMU agreed to join, if this Court requires its presence, then CMU must be joined.

VIII. VARIAN'S DELAY IN ASSERTING INEQUITABLE CONDUCT IS NOT RELEVANT REGARDING THE ISSUE OF JOINING CMU.

Varian's undue delay in seeking to add an inequitable conduct claim does not compare to the present issue of joining CMU as a party plaintiff. Varian was denied because it unduly delayed seeking leave to amend its pleading more than three months after the issue becoming ripe. *See* Docket No. 252 (Order denying Varian's motion to amend answer/counterclaim).

UPitt's motion to join CMU was not unduly delayed. In the interest of justice, UPitt obtained CMU's consent to join as a party if the Court deemed it necessary. Thus, UPitt filed a motion to join CMU in conjunction with its opposition to Varian's summary judgment motion. UPitt's actions were prompt and without delay. The denial of Varian's motion to amend its answer was a much different situation. There, Varian knew about the issue before the close of fact discovery, and unduly delayed before moving to amend. *See* Docket No. 252. Varian's dilatory tactics are not relevant for the present issue before this Court – whether or not to join CMU, and denying Varian's summary judgment motion.

IX. CONCLUSION.

UPitt is the legal title owner to the patents-in-suit, and as such, has standing to sue for patent infringement alone. Any interest in the patents-in-suit held by CMU is equitable in nature, not legal title.

However, after reviewing the papers submitted regarding Varian's summary judgment motion for standing and UPitt's motion to join CMU, the Special Master recommended that the case move forward with CMU joined as a party plaintiff. The Special Master proposed two procedures for accomplishing this goal. UPitt asserts that only one comports with the law: join CMU as a party plaintiff and dismiss Varian's summary judgment motion as moot. Dismissal of this case, even without prejudice to re-file, is not an appropriate remedy, especially when the party to be joined "is subject to service of process and whose joinder will not deprive the court of subject-matter jurisdiction". For that situation, if the party is found to be necessary and indispensable, then "the court must order that the person be made a party".

Varian argues that the case should be dismissed. Yet, as the law and facts demonstrate, that result is not appropriate. Either way, Varian's summary judgment motion should be terminated, either by becoming moot or being dismissed.

DATED: March 26, 2008

Respectfully submitted,

/s/ Rita E. Tautkus

Daniel Johnson, Jr. (*pro hac vice*)
 Rita E. Tautkus (*pro hac vice*)
 Darcy A. Paul (*pro hac vice*)
 MORGAN, LEWIS & BOCKIUS LLP
 2 Palo Alto Square, Suite 700
 3000 El Camino Real
 Palo Alto, CA 94306
 (650) 843-4000
 (650) 843-4001 (facsimile)
djohnson@morganlewis.com
rtautkus@morganlewis.com
dpaul@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
MORGAN, LEWIS & BOCKIUS LLP
One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com

Attorneys For Plaintiff University Of Pittsburgh

APPENDIX A

FILED UNDER SEAL

EXHIBIT N

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH

Plaintiff, v. VARIAN MEDICAL SYSTEMS, INC., Defendant.	Case 2:07-cv-00491-AJS Judge Arthur J. Schwab Filed Electronically
---	---

**DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S
REPLY TO "PLAINTIFF UNIVERSITY OF PITTSBURGH'S RESPONSE TO SPECIAL
MASTER'S REPORT AND RECOMMENDATIONS"**

The position asserted by Plaintiff University of Pittsburgh (“UPitt”) in its Response to the Special Master’s Report and Recommendation (“R&R”) is hypocritical.

UPitt has repeatedly and stridently insisted that Defendant Varian Medical Systems, Inc. (“Varian”) be denied relief whenever UPitt deemed that Varian had failed to act in a timely manner. UPitt successfully asserted that objection to prevent Varian from amending its answer, thereby depriving Varian of an important affirmative defense (inequitable conduct) that could affect the ultimate outcome of this case on the merits were it to go forward. UPitt also successfully opposed several of Varian’s discovery motions on the basis of untimeliness.

Now that UPitt has been found guilty of untimeliness, however — having disregarded the provision of the Case Management Order requiring that new parties be added by June 15, 2007 — UPitt cavalierly suggests that its untimeliness should be ignored and it should be permitted to add Carnegie Mellon University (“CMU”) as a new plaintiff at this late date. That result is absolutely unwarranted. UPitt should be held to the same timeliness standard as Varian, particularly given that UPitt’s delay is entirely inexcusable. UPitt does not dispute that all of the relevant facts showing that CMU was a co-owner of the patents-in-suit and thus a necessary party were in UPitt’s possession at all times, including before this case was filed. Nor does UPitt dispute that it misled Varian and the Court by falsely asserting sole ownership of the patents in the Complaint and in its interrogatory responses. Finally, UPitt does not dispute that Varian would be prejudiced by the addition of CMU as a party at this time, as detailed in Varian’s Objections to the R&R and summarized below. There is no indication in the R&R that the Special Master was aware of these facts or took them into account.

UPitt suggests that granting Varian’s summary judgment motion would “necessitate restarting the case.” Varian disagrees. Granting Varian’s motion should dispose of UPitt’s

claims once and for all. As noted above, UPitt relied on an untimeliness argument to completely deprive Varian of its inequitable conduct defense. Varian was not given the opportunity to assert that defense elsewhere. Similarly, UPitt's failure to join a necessary party within the time limit established by the Court should bar UPitt from pursuing its claim further in this or any other proceeding, particularly considering that UPitt was aware of CMU's patent ownership before and during this litigation but misleadingly claimed to Varian and the Court that it was the sole owner.

Even if UPitt were correct that granting Varian's summary judgment motion would restart the case, that result would not be unjust as UPitt argues. UPitt created this situation and should not be heard to complain about the consequences. Unfortunately, the case cannot simply proceed as if CMU had been a party all along. As explained in Varian's Objections to the R&R, the jurisdictional defect caused by CMU's omission from the case cannot be cured midstream. Allowing the case to continue would create a substantial risk of reversal on jurisdictional grounds, with the result that any additional time spent on this case by the Court and the parties from now until judgment would be completely wasted. Varian already suffered this result in another case and does not want history to repeat itself. *See Varian Medical Systems, Inc. v. Delfino*, 25 Cal. Rptr. 3d 298 (2005). Adding CMU as a party now would also cause prejudice by denying Varian the ability to obtain needed discovery from CMU. UPitt argues that CMU and one of its professors already provided documents and deposition testimony pursuant to subpoenas, but Varian had to limit the scope of its discovery requests to avoid imposing an undue burden on a third party. Varian also was not able to propound interrogatories to CMU or learn CMU's contentions. And Varian may be precluded from using prior deposition testimony against CMU, which was not present at most of the depositions. *See Fed. R. Evid. 804(b)(1)*.

Finally, Varian's summary judgment motion has served the important purpose of resolving a disputed issue in this case: namely, ownership of the patents-in-suit. UPitt does not challenge the Special Master's finding that the evidence supports only the single conclusion that UPitt and CMU are co-owners of the patents. Therefore, under Fed. R. Civ. P. 56(c), "[t]he judgment sought should be rendered . . ." Otherwise, the issue of ownership will remain open and will have to be relitigated at a later point in time, wasting the efforts that all parties and the Special Master put into investigating, litigating, and deciding the summary judgment motion.

For these reasons, Varian strongly disagrees with the arguments stated by UPitt in its Response and respectfully requests that summary judgment be granted in Varian's favor on the issue of standing and judgment entered against UPitt on that basis.

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

By: /s/ Matthew H. Poppe

William L. Anthony, Jr. (admitted *pro hac vice*) (CA 106908)

Matthew H. Poppe (admitted *pro hac vice*) (CA 177854)

Zheng (Jen) Liu (admitted *pro hac vice*) (CA 229311)

1000 Marsh Road

Menlo Park, CA 94025

(650) 614-7400

(650) 614-7401 (fax)

wanthony@orrick.com

mpoppe@orrick.com

jenliu@orrick.com

PICADIO SNEATH MILLER & NORTON, P.C.

Henry M. Sneath, Esquire (Pa. I.D. No. 40559)

hsneath@psmn.com

Shannon M. Clougherty, Esquire (Pa. I.D. No. 88586)

sclougherty@psmn.com

600 Grant Street, Suite 4710

Pittsburgh, PA 15219

(412) 288-4000 [T]

(412) 288-2405 [F]

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of DEFENDANT/COUNTERCLAIMANT VARIAN MEDICAL SYSTEM INC.'S REPLY TO "PLAINTIFF UNIVERSITY OF PITTSBURGH'S RESPONSE TO SPECIAL MASTER'S REPORT AND RECOMMENDATIONS" was served upon all parties either individually or through counsel via:

- ____ Hand-Delivery
____ Facsimile
____ First Class, US Mail, Postage Prepaid
____ Certified Mail-Return Receipt Requested
X ECF Electronic Service
____ Overnight Delivery

at the following addresses:

Rita E. Tautkus
Morgan Lewis & Bockius, LLP
One Market – Spear Street Tower
San Francisco, CA 94105
rtautkus@morganlewis.com

Dated: March 26, 2008

/s/ Matthew H. Poppe

Matthew H. Poppe

EXHIBIT O

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH	)	ELECTRONICALLY FILED
)	
Plaintiff,)	
)	
v.	)	Civil Action No. 2:07-CV-00491-AJS
)	
VARIAN MEDICAL SYSTEMS, INC.	)	Judge Arthur J. Schwab
)	
Defendant.)	

PLAINTIFF'S MOTION REQUESTING ENTRY OF JUDGMENT

TO THE HONORABLE UNITED STATES DISTRICT JUDGE SCHWAB:

University of Pittsburgh ("UPitt") respectfully moves under Rule 58(d) to request entry of judgment to be set out in a separate document in accordance with Rule 58(a). Rule 58(a) states as follows.

Every judgment and amended judgment must be set out in a separate document, but a separate document is not required for an order disposing of a motion: (1) for judgment under Rule 50(b); (2) to amend or make additional findings under Rule 52(b); (3) for attorney's fees under Rule 54; (4) for a new trial, or to alter or amend the judgment, under Rule 59; or (5) for relief under Rule 60.

For an order to be considered a separate document for purposes of Rule 58, it must satisfy three requirements: (1) it must be self-contained and separate from the opinion, (2) it must note the relief granted, and (3) it must omit (or at least substantially omit) the trial court's reasons for disposing of the claims. *See United Auto. Workers Local 259 Social Sec. Dept. v. Metro Auto Center*, 501 F.3d 283, 287 (3d Cir. 2007) (quoting *In re Cendant Corp. Securities Litigation*, 454 F.3d 235, 241 (3d Cir. 2006)).

On April 30, 2008, the Court issued its Order Adopting Special Master's Report and Recommendation (Doc. No. 254) in Part; and Granting Defendant's Motion for

Summary Judgment for Lack of Standing (Doc. No. 127) (“Order”). The Order is six pages long and sets forth the factual background and legal analysis of the Court and in conclusion stated as follows.

Therefore, the Court will adopt in part the Report and Recommendation of the Special Master (doc. no. 254); the Court will sustain the objections contained in Defendant/Counterclaimant Varian Medical System Inc.’s Objections to Report and Recommendation of Special Master Re: Motion for Summary Judgment for Lack of Standing (doc. no. 256) relating to vacating the December 5, 2007 Order (see doc. nos. 255, 271, 272, 281); and the Court grants the Motion for Summary Judgment for Lack of Standing (doc. no. 127) and dismisses this action with prejudice.

Here, the Order is not self-contained and separate from the opinion nor does it substantially omit the Court’s reasons for disposing of the claims. Therefore, UPitt does not believe the Order constitutes a separate document because it does not meet at least the first and third requirements set out by the Third Circuit for complying with Rule 58(a). *See, e.g., Picquin-George v. Warden, FCI-Schuylkill*, No. 06-2850, 2006 WL 2917552, at *1 n.1 (3d Cir. 2006) (holding that the District Court did not comply with the separate-document rule because its order language was placed at the end of a seven-page document substantially devoted to recitation of procedural history and legal analysis); *Bartelli v. Nagy*, No. 06-1311, 2007 WL 1115830, at *1 (3d Cir. 2007) (finding that an order adopting a magistrate judge’s recommendation granting summary judgment was not a separate document under Rule 58 because the order presented the facts and procedural history in the order).

Additionally, in its Order, the Court stated it “dismisses *this action* with prejudice.” (emphasis added). UPitt understands this Court’s Order to mean that the entire action is dismissed with prejudice and, thus, the entire case is dismissed including all of UPitt’s claims and all of Varian Medical Systems, Inc.’s (“Varian’s”) counterclaims.¹ However, on May 6,

¹ On May 12, 2008, UPitt’s counsel spoke with the Court Clerk who explained that the Court’s intention was to dispose of the entire case, dismissing all claims and counterclaims with

2008, Varian's counsel sent a letter to UPitt's counsel asking UPitt to stipulate to a dismissal *without* prejudice of Varian's counterclaims. UPitt's counsel responded on May 14, 2008 explaining that it could not agree with Varian's proposed stipulation to dismiss Varian's counterclaims *without* prejudice because UPitt's understanding is that the Court intended to dismiss the *entire action with prejudice*. Furthermore, it is illogical for Varian to request that its counterclaims be dismissed without prejudice but UPitt's claims be dismissed with prejudice. If the Court found, as it did, that Carnegie Mellon University ("CMU") is a necessary party to this action and it is too late for UPitt to amend its Complaint, the same reasoning applies to Varian's counterclaims for declaratory relief that the patents-in-suit are invalid and are not infringed by Varian. Varian's counterclaims are only asserted against UPitt and not CMU and for the same reasons stated in the Order, it would be too late for Varian to amend its Answer to add CMU to add CMU as a party. *See H.R. Technologies, Inc. v. Astechnologies, Inc.*, 275 F.3d 1378, 1386 (Fed. Cir. 2002) (affirming the district court's decision dismissing plaintiff's claim of infringement and defendant's counterclaim of non-infringement for lack of standing and noting the dismissal of defendant's counterclaim of non-infringement was correct because the counterclaim is asserted against the wrong party due to the standing defect in the underlying claim). Accordingly, although UPitt would have liked to file a joint motion with Varian requesting entry of final judgment, the parties are at a disagreement as to what the final judgment is, so UPitt has filed the present motion.²

Regarding the disposition of this action, the dismissal for lack of standing is not on the

prejudice, but that a final judgment had not yet been entered. The Court Clerk recommended filing a motion for entry of judgment to make sure that all claims and counterclaims were dismissed. The Court Clerk also recommended that the parties file a joint motion if possible.

² However, the parties are not required to file a joint motion. Rule 58(d) states that "[a] party may request that judgment be set out in a separate document as required by Rule 58(a)" (emphasis added).

merits of the case. *See* Fed. R. Civ. P. 41(b); *Korvettes, Inc. v. Brous*, 617 F.2d 1021, 1024 (3d Cir. 1980) (“A dismissal for lack of jurisdiction is plainly not a determination of the merits of a claim.”) Additionally, UPitt respectfully disagrees with the Court’s dismissing the action *with prejudice*. Rather, the dismissal should be *without prejudice*. *See Korvettes*, 617 F.2d at 1024 (“Ordinarily, such a dismissal is ‘without prejudice.’”); *see, also, H.R. Techs., Inc.*, 275 F.3d at 1385. Thus, for the Court’s convenience, UPitt respectfully submits two proposed Judgments to the present motion: Exhibit A dismissing the action without prejudice and Exhibit B dismissing the action with prejudice.

DATED: May 15, 2008

Respectfully submitted,

/s/ Rita E. Tautkus

Daniel Johnson, Jr. (*pro hac vice*)
 Rita E. Tautkus (*pro hac vice*)
 Darcy Paul (*pro hac vice*)
 MORGAN, LEWIS & BOCKIUS LLP
 2 Palo Alto Square, Suite 700
 3000 El Camino Real
 Palo Alto, CA 94306
 (650) 843-4000
 (650) 843-4001 (facsimile)
djohnson@morganlewis.com
rtautkus@morganlewis.com
dpaul@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
 MORGAN, LEWIS & BOCKIUS LLP
 1701 Market Street
 Philadelphia, PA 19103
 (215) 963-5937
 (215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
 MORGAN, LEWIS & BOCKIUS LLP
 One Oxford Centre, 32nd Floor
 Pittsburgh, PA 15219
 (412) 560-3300
 (412) 560-7001 (facsimile)
cramsey@morganlewis.com

Attorneys for Plaintiff
University of Pittsburgh

EXHIBIT A

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)	
)	
Plaintiff,	)	FILED ELECTRONICALLY
)	
v.)	
	)	Civil Action No. 2:07-cv-00491-AJS
VARIAN MEDICAL SYSTEMS, INC.)	
	)	Judge Arthur J. Schwab
Defendant.)	
)	
)	

[PROPOSED] JUDGMENT

AND NOW, to-wit, this _____ day of _____, 2008, in accordance with this Court's "Order Adopting Special Master's Report and Recommendation (Doc. No. 254) in Part; and Granting Defendant's Motion for Summary Judgment for Lack of Standing (Doc. No. 127)" [Doc. No. 294], the Court hereby enters final judgment in this action.

It is hereby ORDERED, ADJUDGED and DECREED that:

1. All of Plaintiff University of Pittsburgh's claims for relief set forth in its Complaint (Document No. 1) are DISMISSED WITHOUT PREJUDICE.
2. All of Defendant and Counter-Plaintiff Varian Medical Systems Inc.'s claims for relief set forth in its Answer and Counterclaims (Document No. 20) are DISMISSED WITHOUT PREJUDICE.

JUDGMENT IS ENTERED.

BY THE COURT:

The Honorable Arthur J. Schwab
United States District Judge

EXHIBIT B

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH)
Plaintiff,)
v.)
VARIAN MEDICAL SYSTEMS, INC.)
Defendant.)

))
FILED ELECTRONICALLY
)
)
Civil Action No. 2:07-cv-00491-AJS
Judge Arthur J. Schwab
)

[PROPOSED] JUDGMENT

AND NOW, to-wit, this _____ day of _____, 2008, in accordance with this Court’s “Order Adopting Special Master’s Report and Recommendation (Doc. No. 254) in Part; and Granting Defendant’s Motion for Summary Judgment for Lack of Standing (Doc. No. 127) [Doc. No. 294], the Court hereby enters final judgment in this action.

It is hereby ORDERED, ADJUDGED and DECREED that:

1. All of Plaintiff University of Pittsburgh's claims for relief set forth in its Complaint (Document No. 1) are DISMISSED WITH PREJUDICE.
 2. All of Defendant and Counter-Plaintiff Varian Medical Systems Inc.'s claims for relief set forth in its Answer and Counterclaims (Document No. 20) are DISMISSED WITH PREJUDICE.

JUDGMENT IS ENTERED.

BY THE COURT:

The Honorable Arthur J. Schwab
United States District Judge

EXHIBIT P

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH,

Plaintiff,

07cv0491

ELECTRONICALLY FILED

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

JUDGMENT

AND NOW, to-wit this 16th day of June, 2008, in accordance with this Court's "Order Adopting Special Master's Report and Recommendation (Doc. No. 254) in Part; and Granting Defendant's Motion for Summary Judgment for Lack of Standing (Doc. No. 127)" [Doc. No. 294], the Court hereby enters final judgment in this action. It is hereby ORDERED, ADJUDGED, and DECREED as follows: All of Plaintiff University of Pittsburgh's claims for relief set forth in its Complaint (Doc. No. 1) are DISMISSED WITH PREJUDICE.
JUDGMENT IS ENTERED.¹

s/ Arthur J. Schwab

Arthur J. Schwab
United States District Judge

cc: All Registered ECF Counsel and Parties

¹This Order also grants in part and denies in part Plaintiff's Motion Requesting Entry of Judgment (doc. no. 295). The relief requested at ¶ 1 of the proposed Judgment (doc. no. 295-3) is granted, and that requested at ¶ 2 is denied.

EXHIBIT Q

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

UNIVERSITY OF PITTSBURGH	)	ELECTRONICALLY FILED
)	
Plaintiff,	)	NOTICE OF APPEAL
)	
v.	)	Civil Action No. 2:07-CV-00491-AJS
)	
VARIAN MEDICAL SYSTEMS, INC.	)	Judge Arthur J. Schwab
)	
Defendant.)	

Notice is hereby given that Plaintiff University of Pittsburgh in the above named case hereby appeals to the United States Court of Appeals for the Federal Circuit from the final judgment entered in this action on 16th day of June, 2008.

DATED: June 16, 2008

Respectfully submitted,

/s/ Rita E. Tautkus

Daniel Johnson, Jr. (*pro hac vice*)
Rita E. Tautkus (*pro hac vice*)
Darcy Paul (*pro hac vice*)
MORGAN, LEWIS & BOCKIUS LLP
2 Palo Alto Square, Suite 700
3000 El Camino Real
Palo Alto, CA 94306
(650) 843-4000
(650) 843-4001 (facsimile)
djohnson@morganlewis.com
rtautkus@morganlewis.com
dpaul@morganlewis.com

David W. Marston Jr. (Pa ID No. 84399)
MORGAN, LEWIS & BOCKIUS LLP
1701 Market Street
Philadelphia, PA 19103
(215) 963-5937
(215) 963-5001 (facsimile)
dmarston@morganlewis.com

Christopher K. Ramsey (Pa ID No. 63293)
Elizabeth Stroyd Windsor (Pa ID No. 92010)
MORGAN, LEWIS & BOCKIUS LLP

One Oxford Centre, 32nd Floor
Pittsburgh, PA 15219
(412) 560-3300
(412) 560-7001 (facsimile)
cramsey@morganlewis.com
ewindsor@morganlewis.com

Attorneys for Plaintiff
University of Pittsburgh